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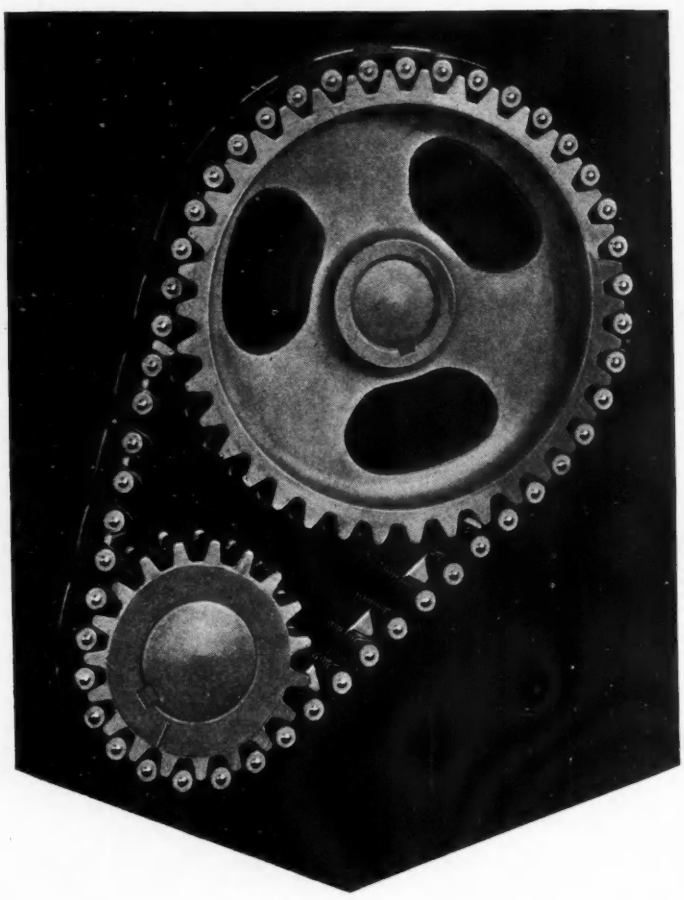

LINK-BELT
AUTOMOTIVE SILENT CHAIN

AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

Reg. U. S. Pat. Off

Published Weekly

Volume 73 Number 13

JULIAN CHASE, Directing Editor

P. M. HELDT, Engineering Editor — JEROME H. FARRIS, Ass't Editor
JOS. GESCHELIN, Detroit Technical Editor — T. LAWTON SLAUGH, News Editor
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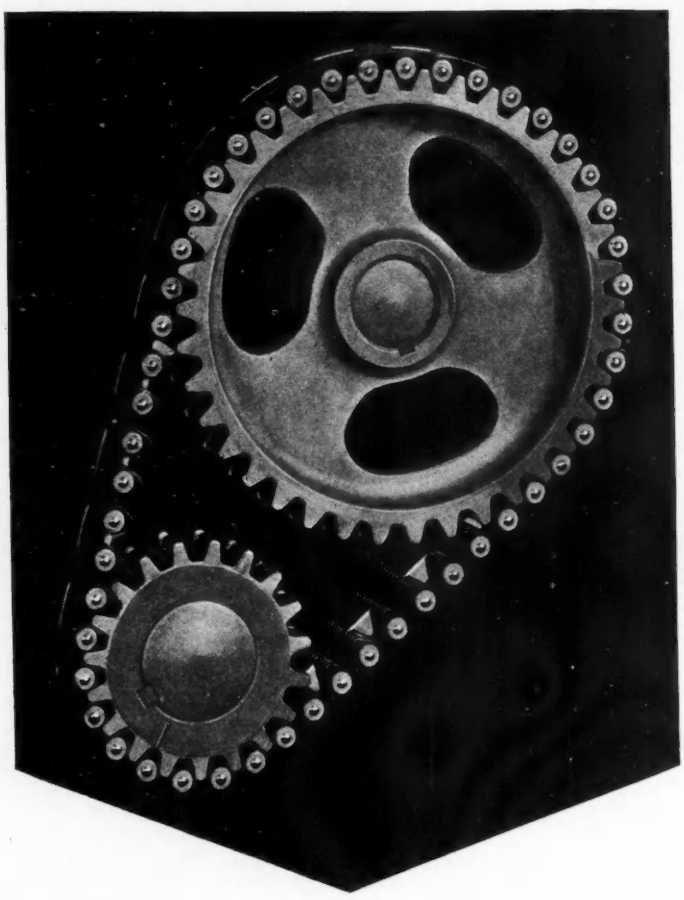

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AUTOMOTIVE INDUSTRIES

Vol. 73, No. 13 ▫ THIRTY-SEVENTH YEAR ▫ September 28, 1935

Output Passes 3 Million Mark

700,000 Likely in Fourth Quarter; Field Stocks Low

by Harold E. Gronseth
Detroit News Editor, Automotive Industries

All indications point to a heavy fourth quarter output by the motor industry. If the latest prediction by good authority of 3,700,000 cars and trucks for the full year is to be realized then the final three months will have to account for approximately 700,000 units, since production just recently passed the 3,000,000 mark.

Most plants are now under way on their new model production. The few that have not started will swing into line October 1 or shortly thereafter. Daily output of the early birds is attaining sizeable proportions and the volume producers have begun assembly operations. A well sustained retail demand combined with the recent lull in production is fast depleting field stocks, in fact producing vacuums in some quarters that will have to be filled up by a heavy initial production on new models. The industry started September with an estimated 239,000 passenger cars in the field and earlier this week one statistician estimated stocks were down to 160,000 cars. Very few 1935 models will remain to be sold when the sales campaign on 1936 cars is formally launched at the New York Automobile Show starting November 2.

The usually reliable forecasts of car loadings by the Great Lakes regional advisory Board of the Association of American Railways provides further evidence of the high rate of manufacturing activity anticipated in the automobile district during the final quarter this year. The automobile committee of the Board predicted that rail shipments of finished automobiles during the next three months would probably exceed the same period of 1934 by 200 per cent when combined with shipments of automobile parts, tires and other accesories. The increase is estimated to be 154.8 per cent, car requirements being placed at 92,361 compared with 36,239 in the fourth quarter last year.

A total of 402,352 cars and trucks were

(*Turn to page 410, please*)

Alfred P. Sloan, Jr.
" . . . we must liquidate the panaceas and discard quack theories"

Hudson Starts '36 Output; Financial Position Strong

Roy D. Chapin, president of Hudson Motor Car Company, announces that the company will go into production of its 1936 line the first week in October, the earliest date in recent years. The moving ahead of the production schedule from late fall to early fall, Mr. Chapin stated, is in accordance with policy adopted by the entire automobile industry to endeavor to level out production and employment.

"Hudson begins its 1936 season in the best financial position the company has enjoyed in many years," said Mr. Chapin. "On June 30, cash was $9,475,890 which was 2½ times as great as on Dec. 31, 1934, representing 70 per cent of total current assets against 30 per cent at the year-end."

Fight on Panaceas, "Quack" Theories Urged by Sloan in Lansing Address

A liquidation of the panaceas and a discarding of quack theories as a means of healing the nation's economic ills were urged by Alfred P. Sloan, Jr., GM president, in a speech delivered in Lansing on Wednesday. Mr. Sloan spoke at a luncheon given GM executives by the Lansing Chamber of Commerce.

"We are not going to tolerate further interference in recovery," Mr. Lansing said. "Industry is already feeling the effects of the so-called breathing spell which had been promised us. Times are surely getting better. We have reached a point where we are convinced that the depression is behind us. Now we must face the problem of liquidating some of the actions injected into the picture. Now it is time for the people of the United States to get back to sound fundamentals and we must liquidate the panaceas and discard quack theories.

"Production and sales of motor cars outside the United States in 1935 will equal anything in world history. In England, for instance, for three consecutive years new records in sales and production have been set. In Germany, despite other conditions, a new record was set last year and it looks like this year will be better.

"There are two forces at work today. There is this force of real recovery and, acting against it, there is the deflationary force of adverse political action. If the first is in the ascendency, things will get better. I have confidence that they will be.

Selling Licenses, 15% Maximum Finance Charge Required by Wisconsin Sales Law

Wisconsin's new instalment sales contract law has been signed by Governor LaFollette; it becomes effective January 1, 1936. Following somewhat the general outline of the Indiana law passed last year the Act imposes certain prohibitions upon sales finance companies, manufacturers, retail dealers and salesmen designed to protect the instalment buyer from mulcting by unscrupulous retailers and loan sharks.

Apparently representatives of finance companies and automotive trade associations are not greatly concerned over the regulatory measure. The consensus of opinion seems to be that if this business must be state regulated the Wisconsin law is a satisfactory piece of legislation.

Briefly the Act provides for the licensing of dealers, salesmen and financial companies doing an instalment business; forbids coercion of retailers by manufacturers to deal exclusively with one finance company; prohibits subsidizing of finance companies by manufacturers in any way that may be construed as an unfair trade practice designed to stifle competition; fixes a maximum finance charge of 15 per cent annually (called "interest" in the language of the law); provides for bonding of applicants for licenses not in excess of $5,000 and requires finance companies to inform retail purchasers within 30 days of the acquirement of their contract. Penalties for violations are fixed at a maximum fine of $10,000 or one year in jail or both.

Discussing the 15 per cent maximum charge clause one finance company man expressed the belief that "for all practical purposes that clause is meaningless," pointing out that there is nothing in the Act to indicate that the finance charge is to be regarded as interest and that it is unlikely the Wisconsin Banking Commission, which will administer the law, will attempt to construe the clause as a limitation upon the finance charge. This same official said he felt certain "the law imposes no limitation whatever on the excess of the time price over the cash price."

Apparently the larger finance companies are not concerned about the bonding provision, for it is the general belief that the Commission will resort to the protection of this proviso only when it feels some doubt as to the integrity of the applicant for licensing.

At the time the legislative committee was holding hearings upon the measure it is understood representatives of several large finance companies were present and were given opportunities to express their ideas concerning the measure's composition. Those companies which were represented at the hearings are understood to have given the measure their general approval as it was ultimately enacted into law.

Wisconsin automobile dealers, according to Lewis Milan, secretary-manager of the Wisconsin Automotive Trades Association, had a hand in framing the law and feel that in its administration all dealers doing business on a legitimate basis cannot be harmed. Mr. Milan said it was admitted that regulation was needed, particularly in used car merchandising practices as an investigation by a legislative interim committee revealed.

Management Keystone of Success, Knudsen Says

"In those plants where there is the best foreman control, there is the least labor trouble," W. S. Knudsen, GM executive vice-president, said during his speech at the recent National Machine Tool Congress in Cleveland. "If you have dealing with your men a set of executives who are square you will go ahead and you will have the minimum of difficulty with your forces."

Mr. Knudsen said that today much is heard about capital and labor, but little of management; yet management, he said, is the keystone of successful enterprise. Too frequently the mistake is made of not recognizing the foreman as a part of management, Mr. Knudsen told his audience, and the order of affairs must be reestablished where the foreman is part of that management on a broader scale than has been the policy of recent years.

It is to the foreman that management must look for more intimate relationships between itself and the employees, the GM executive stated. The foreman has two duties, according to Mr. Knudsen, one to the product and one to the men and both should be equally important. None in a plant can eliminate avoidable accidents so quickly and thoroughly as the foreman and it is to him management must look for the instruction of employees.

"Unless he does that work well," Mr. Knudsen said, "he can't get quantity and quality and safety. The foreman must know not only his particular part, but the whole product. We must train him. If he knows as much about the job as you do he will probably see it as you see it and do it the way you want it done."

Sooner or later management must look for a new crop of superintendents, production and plant managers, Mr. Knudsen warned.

First Choice Show Space Given Chevrolet 9th Time

Chevrolet again has been awarded first choice of exhibit space at the New York and Chicago Automobile Shows. The space is awarded by the AMA on the basis of highest dollar volume sales. This is the ninth consecutive time Chevrolet has won first place.

Endurance Test of Terraplane Engine Shows Motor Satisfactory for Aircraft

A test to determine whether a stock automobile engine would function satisfactorily under aircraft operating conditions over an extended period of time, and to determine the effectiveness of V-belts and pulleys as a method of drive and speed reduction has just been completed by the Casey Jones School of Aeronautics, Newark, N. J., for the Department of Commerce.

The equipment used was a standard six cylinder, 100 h.p. Terraplane engine, mounted low in a wooden frame stiffened with iron supports, attached rigidly at the front and on rubber pads at the rear, and installed in an open shack at the Newark Airport, with the front of the engine, pulleys, belts and propeller outside the building. The standard starter, generator and ignition system were used throughout the test. No changes or alterations were made in the engine. The belts were manufactured by the Manhattan Rubber Co.

The test was conducted under very unfavorable conditions, as most of the apparatus was exposed, it was run under all kinds of weather conditions. The propeller was a tractor, so the belts and engine were in the slip stream and were constantly deluged with dirt, dust and oil. This was done purposely, in order to make the test as severe as possible. Furthermore, most of the test was conducted by students from the Jones school and not by experienced personnel.

The conclusions arrived at were:

1. The V-belt and pulleys supply a safe, efficient, light and economical drive, suitable for use in airplane operation with engines up to 120 h.p.
2. The Terraplane engine, producing approximately 100 h.p., will perform satisfactorily for airplane operation.

It is believed that without additional expense, the weight of the engine dry, can be reduced to approximately 3½ lb. per h.p., with further reduction at some additional cost.

The weight installed will probably be somewhere around 5 lb. per h.p. Obviously this is heavy in comparison with existing airplane engines, and some sacrifice in performance must be accepted if the low cost of the automobile engine is to be taken advantage of. The weights are very similar to the old OX, and the h.p. is greater by ten. A number of creditable airplanes were built around the OX when the industry was far less advanced than today, so it would seem that a reasonable performing airplane with this type of engine is entirely feasible.

Show Start of Cooperative Employment Experiment, AMA View; Car Space Taken

The opening of the New York Automobile Show Nov. 2 in Grand Central Palace, New York City, will signalize the start of an experiment in cooperative employment, an industrial planning project undertaken by private capital and management at the request of the President of the United States with a view to leveling off the peaks and valleys of employment in a seasonal industry, according to the Automobile Manufacturers Association.

Under agreement made with President Roosevelt last year by leaders of the industry the show date was moved to November from January "as a means of facilitating regularization of employment in the industry."

The committee in charge of the show has announced that all available display place for passenger cars and commercial vehicles has been taken. This year's committee includes Alfred H. Swayne, GM vice-president; Byron C. Foy, DeSoto president; Paul G. Hoffman, president of Studebaker, and Alfred Reeves, AMA vice-president and general manager, as show manager.

Speaking of the new move Alvan Macauley, president of Packard and AMA, said: "We are hopeful that by advancing the beginning of new model production from the first of the year to the fall, more constant employment, spread over more months, for workers directly or indirectly dependent upon automobile manufacture will result.

"If, as we expect, the experiment proves successful, we are confident that it will increase the annual earnings of automobile workers to a level well above that of comparable factory workers anywhere in the world."

Mr. Macauley pointed out that the change will bring a revision in the seasonal curve because production will naturally drop during the third quarter of the year and rise during the last quarter, thus leveling off the peaks of the spring trade.

Jan.-Aug. New Car Sales 37% Above 1934 Period

The late summer strength of the automobile retail buying market is shown in the preliminary adjusted index of retail car sales prepared by the Bureau of Foreign and Domestic Commerce of the Department of Commerce. The Bureau's index shows a slight seasonal decline for August from the July level, but a position considerably above that for August of last year.

This index, which makes allowance for numbers of days as well as seasonal movements, was 71.0 for August on the basis of the 1929-1931 average of 100, which compares with 81.0 for July. Sales during August this year were, on the basis of this index, 27 per cent greater than in August, 1934, and 37 per cent higher than the same month's sales in 1933. The aggregate, according to the report, for the January-August period this year was 36 per cent above that for the corresponding period a year ago and 90 per cent higher than the first eight months of 1933.

Stout SAE Production Activity Dinner Speaker

Symposium at Machine Tool Congress Most Impressive Ever Staged

SAE's Production Activity staged its most impressive meeting in years at the third Machine Tool Congress last week. The production symposium of five papers, held September 18, drew an attendance of over 200, while the dinner on September 19 attracted about 250 guests.

The Production Symposium led by Joseph Geschelin, Detroit Technical Editor, *Automotive Industries*, featured five speakers representing a great cross-section of automotive activity. John R. Cox of Thompson Products gave a quick review of the Machine Tool Exposition, covering some of the high spots of this remarkable show. The other men on the program were S. O. White, chief engineer, Warner Gear Co., E. L. Bailey, electrical engineer, Chrysler Corp., F. P. Spruance, of the American Paint Co., and J. A. Weiger, chief metallurgist, P. R. Mallory & Co.

The dinner was a huge success, with W. B. Stout, SAE president, as one of its features. W. C. Brown of General Electric substituted for A. T. Colwell as chairman, due to the sudden death of Mr. Colwell's father. V. P. Rumely, of Hudson Motor and vice-president of the Production Activity, was toastmaster.

Mr. Stout enlivened his talk with a motion picture showing the Scarab, the Scarab bus, the Stout railcar, and Stout aircraft.

August New Car Retail Financing Up 8% Over '34

The dollar volume of new car retail financing for August, according to a preliminary estimate by the Department of Commerce, shows an eight per cent increase over the same month last year and a gain of 32 per cent over the corresponding month of 1933. Compared with July of this year the August dollar volume declined about 16 per cent, the report indicates.

The aggregate volume for the first eight months of this year was 17 per cent above that of the similar period last year and 91 per cent higher than the corresponding eight months of 1933, according to the Commerce Department report.

Chevrolet Used Car Adv. Boosts Dealer's Sales

Since increasing the scope of its national advertising campaign to include used cars the Chevrolet Motor Co. reports it has been receiving word from dealers throughout the country that used car sales have been considerably stimulated and that a large number of buyers are seeking reconditioned cars for winter driving.

ASM to Hear Irvin

William A. Irvin, president of the United States Steel Corporation, will address the members of the American Society for Metals, at their annual banquet to be held Thursday, Oct. 3, in the ballroom of The Palmer House, Chicago, W. H. Eisenman, national secretary of the Society announced.

E. L. Bailey

J. R. Cox

F. P. Spruance

Who participated in SAE Production Activity Symposium

Detroit Labor Board Organized; Report Employers Not Planning Rush to Courts

The new National Labor Relations Board opened its regional office in Detroit last week with F. H. Bowen, field representative of the NLRB, as acting director. G. L. Patterson, of Washington, has been named regional attorney. As yet, an examiner has not been appointed, although Raymond R. Cameron, assistant examiner on the old board, was retained and is working with the new officers.

Mr. Bowen succeeds the Rev. Fr. Frederic Seidenburg, director of the former regional board, who resigned as of Sept. 15. A graduate mining engineer, Mr. Bowen's experience covers a wide range including newspaper, automobile and brokerage fields.

Special interest is attached to the Detroit regional board because of its contact with the important motor industry. It will be recalled that under the old set-up a separate agency, the Automobile Labor Board, headed by Dr. Leo Wolman, was established for automobile workers' complaints. This board, early in its existence, was repudiated by the American Federation of Labor. The new board which is to administer the Wagner Labor Act in this district will have distinctly different scope from either the Wolman Board or the old NRA Board.

While it will be ready to function next week, no complaints have been filed with the board as yet. Some minor matters have come up which have been talked over, Mr. Bowen stated, but "just now everything seems to be quiet around here." It is expected that the Fruehauf Trailer case involving a discrimination complaint, filed with the National Labor Relations Board by counsel for the AFL, will be transferred to the Detroit office for hearing.

F. J. Dillon, president of AFL's newly chartered United Automobile Workers International Union, said it would be the purpose of his office "to cooperate with the new board in an endeavor to make the spirit and intent of the law a success and thereby bring about, in industry generally, a just and proper employer-employee relationship." He said he had no complaints to file with the board at this time.

No determined opposition to the board is expected on the part of employers, that is, there is not likely to be any mad rush to high courts to test the new law. Of course procedure will have to be determined by individual cases but there seems to be a disposition to give the board a trial. Whether or not jurisdiction of the new board is recognized, it is conceded to be the part of wisdom for an employer against which a complaint is made to appear before the examiner and present his case since higher courts will not question the findings of facts but will deal only with matters of law.

Home from Europe on the Aquitania — Ben Hopkins, president of the Cleveland Graphite Bronze Co., who arrived in New York on Monday of this week

Finance Cos. Urged to Prove Worth of Service

Vigorous action aimed at showing the public that time payment facilities are worth what they cost and at developing a more favorable public attitude toward the business, was urged on members of the National Association of Sales Finance Companies by T. E. Courtney, president, at the opening session of the organization's twelfth annual meeting which began Thursday at White Sulphur Springs, W. Va.

As a part of activity along this line, a proposal for a national educational advertising campaign was placed before the membership for consideration. The need for aggressive efforts to improve the public relations of the business, it was pointed out, have been accentuated by the flood of bills designed to regulate finance companies which were introduced at last winter's session of state legislatures and by the possibility of further government competition.

Steel Production High On Automotive Demand

At the threshold of the year's final quarter, the steel market's outstanding feature continues to be the steady support it has enjoyed from automotive consumers in the last few months. This, it is well recognized, has made it possible for the steel industry to operate this week at 48.9 per cent of its ingot capacity, compared with 24.2 per cent in the corresponding week of last year. Flat steel producers did not have enough business a year ago to keep more than 25 per cent of their capacity employed, while this week sheet mills are for the most part operating at close to 75 per cent of their capacity, with some doing considerably better, and strip mills that a year ago had hard sledding to maintain an operating rate of 20 per cent, running at between 50 and 55 per cent.

Comparison between conditions in the market for cold finished steel bars a year ago and today reveals fully as marked recovery, and this holds even more true of automotive alloy steels. While some new business was placed by both motor car manufacturers as well as parts makers in the last few days, steel company sales managers look for a much more marked quickening in the issuing of specifications and shipping orders in October. Aside from minor revisions in discounts on bolts and nuts and the changed extras in cold-rolled bars, which become effective Oct. 1, prices remain unchanged.

President Reverses Position on NRA, Says No New Bill if Industry Ousts Chiselers

President Roosevelt apparently has reversed himself on his NRA position. At his Wednesday press conference he told Washington correspondents there would be no need for new NRA legislation if industry voluntarily establishes fair trade practices and eliminates chiseling. Such a position is directly contrary to that the President expressed immediately prior to the adjournment of Congress when he sent a message asking new NRA legislation at the next session.

Mr. Roosevelt stated no thought had been given to a specific NRA measure for the next Congressional assembly. Less than a fortnight ago Representative Hill of the House Ways and Means Committee announced a subcommittee of the same group would convene Nov. 15 to consider a tentative NRA bill. This bill, Mr. Hill intimated, has already been drafted, closely observing the Constitutional restrictions laid down by the Supreme Court in its Schecter case decision that killed the former NRA set-up.

The skeletonized NRA, created by the extension of the Recovery Act last spring, is now at work surveying 23 basic industries of the country to determine the effect of code abolition upon hours, wages and working conditions. Whether early reports from the results of these studies have influenced President Roosevelt in his latest view concerning industrial regulation was not intimated at the conference.

Earlier this week Donald R. Richberg, former NRA administrator and Number One New Deal man, issued a statement in which he admitted he was wrong in his earlier prediction that NRA dissolution would bring chaos in industry. Mr. Richberg in this pronouncement admitted industrial recovery has set in. How much weight Mr. Richberg's views have had in influencing the President to an apparent reversal of position on this subject is a matter of conjecture.

However, one fact stands out significantly and is freely admitted by some ardent NRA supporters—that the passing of NRA regulation of industry and commerce was followed almost immediately by a substantial industrial upturn.

Employment Decline Exceeds Payrolls for Second Month

Federal Reserve Indexes—1923-1925 = 100

Unadjusted

	Aug., '35	July, '35	Aug., '34
Production	69	100	67
Employment	95.3	100.6	92.5
Payroll	80.7	85.7	76.5

Adjusted

	Aug., '35	July, '35	Aug., '34
Production	64	95	61
Employment	95.1	97.7	92.3
Payroll	...	...	...

Mayo, Merriman, Drake Remain on Hupp Board as Andrews Loses Proxy Fight

The temporary injunction obtained by Archie M. Andrews and Frederick N. Dodge in Chancery Court, Richmond, Va., restraining directors of Hupp Motor Car Corp. from holding the annual meeting which had been scheduled for Sept. 11, at Richmond, Va., has been lifted and the suit dismissed.

At the postponed annual meeting, held Sept. 24, W. B. Mayo, Seward L. Merriam and J. Walter Drake were re-elected to the board of directors. Mr. Andrews lost the proxy fight, over 725,000 shares of the approximately 1,300,000 outstanding being represented by the proxy committee appointed by the present management and which was pledged to support the above directors.

The corporation has developed a full line of models in both six and eight cylinder cars on which production will start about October with a minimum schedule for the month of 1800 cars. In contrast with only one type of car, a four-door sedan, in its popular priced line, the new line will have standard and de luxe models of coupes, four-door sedans, four-door touring and two-door sedans.

In a letter to stockholders dated Sept. 18, Vern R. Drum, president, outlines the progress made by the corporation under the new management which assumed control May 7, 1935.

Mr. Drum points out that shrinkage in working capital in the three months, May, June and July, was less than $100,000, compared with $700,000 in the four months preceding. Starting with $2,136,160 on Jan. 1, 1935, net working capital dropped to $1,403,016 on April 30, and by the end of July was $1,307,481.

The letter states that Hupp's operating loss during July was $112,950, compared with $165,176 in June and $81,275 in May, a total of $359,400 or less than $120,000 a month. During the four months ended April 30, under previous management, total operating loss was $880,503, an average of approximately $220,000 a month. Operating expenses, including factory and administrative expenses and depreciation on buildings and equipment, has been reduced to $236,000 a month during the latter period from $318,000 monthly under former management, a saving of $82,000 a month or $246,000 for the three months period.

"Sales of cars for the first four months of the year totaled 3363. Sales for May, June and July totaled 3478. The loss in March, when 1498 cars were sold, was $172,703. The loss in May—when practically the same number of cars, namely 1562, were sold—was only $81,275.

Packard Plans 79,000 Car Production in '36

1935 Sales Proved Company Could Sell in Lower Priced Field Macauley Tells Staff

A total of 79,000 cars has been scheduled by Packard Motor Car Co. for the 12 months beginning Oct. 1. This announcement was made to more than 2000 distributors and dealers who attended what was the largest sales convention in Packard's history.

"Considering present conditions," said M. M. Gilman, general sales manager, "the trend of general business, an increased number of sales outlets and a more balanced sales effort, we anticipate a production of 9000 of our larger cars and 70,000 of our One-Twenty's in the next 12 months."

Since the advent of its new 120 line, Packard's dealer organization has been more than doubled, Mr. Gilman pointed out. He said that the company had built more than 34,000 cars during the last 12 months deposite the fact that production of the 120 was not up to full schedule until May.

"We have had a grand beginning during 1935," Alvan Macauley, Packard president, told the visitors at the business session of the convention Monday morning. "But we regard it only as a beginning," he added. "We have proved that we could, by a bold stroke, thoroughly establish ourselves in the lower priced field."

Packard Prices for 1936 Models

Packard 120 Series

Business coupe	$990
Sport coupe	1,030
Touring coupe	1,040
Convertible coupe	1,110
5-pass. sedan	1,075
Club sedan	1,090
Touring sedan	1,115

Eight

1400—122-in. W. B.

5-pass., 4-door sedan	$2,385

1401—124-in. W. B.

5-pass., 4 door sedan	2,585
5-pass. formal sedan	3,285
2-4-pass. coupe roadster	2,730
2-4-pass. coupe	2,470
4-pass. phaeton	3,020
5-pass. club sedan	2,580
5-pass. coupe	2,560
5-pass. victoria	3,200

1402—139-in. W. B.

7-pass. touring	3,270
7-pass. sedan	2,755
7-pass. limousine	2,890
5-pass. conv. sedan	3,400
8-pass. bus. limousine	2,765
8-pass. bus. sedan	2,630

Super Eight

1403—132-in. W. B.

5-pass., 4-door sedan	2,990

Super Eight

1404—139-in. W. B.

5-pass. formal sedan	3,800
2-4-pass. coupe roadster	3,070
2-4-pass. coupe	2,880
4-pass. phaeton	3,390
5-pass. club sedan	3,170
5-pass. coupe	3,080
5-pass. sport phaeton	3,650
5-pass victoria	3,860

1405—144-in. W. B.

7-pass touring	3,690
7-pass. sedan	3,390
7-pass. sedan limousine	3,580
5-pass. conv. sedan	4,010
8-pass. bus. limousine	3,455
8-pass. bus. sedan	3,265

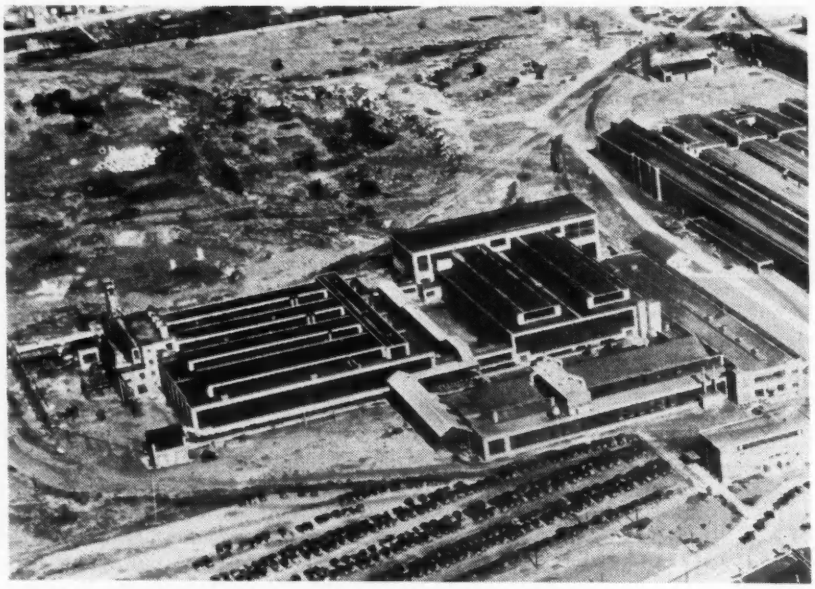
Twelve

1407—139-in. W. B.

5-pass. coupe	3,990
2-4-pass. coupe	3,820
Coupe roadster	3,850
4-pass. phaeton	4,190
Club sedan	4,060
Formal sedan	4,660
5-pass. 4-door sedan	3,960
Victoria	4,890
5-pass. sport phaeton	4,490

1408—144-in. W. B.

7-pass. sedan limousine	4,485
5-pass. conv. sedan	5,050
7-pass. sedan	4,285
Touring	4,490



The Pontiac foundry at Pontiac, shortly to be reopened

Israel Elected President Of Warren Nash Motor

Richard H. Israel, who two months ago was made acting president of Warren Nash Motor Corp., New York distributor of Nash and LaFayette cars, to succeed Charles B. Warren, resigned, was elected president of that company at a meeting of its directors held last week.

The directors of Warren Nash Motor Corp. unanimously reelected at the annual stockholders' meeting, also held last week, are, in addition to Mr. Israel, E. H. McCarty, C. H. Bliss and Courtney Johnson, who are respectively president, vice-president and director of sales, and general sales manager of The Nash Motors Company. Mr. Israel was formerly eastern sales manager for The Nash Motors Company.

Sparks-Withington

Sparks-Withington Co. reports for year ended June 30, 1935, a net loss of $167,738 which compares with net loss of $344,381 in preceding year. Indicated net loss for the six months ended June 30, 1935, was $18,761 against net loss of $148,977 in preceding six months and net loss of $179,925 in first half of 1934. Current assets as of June 30, last, including $353,735 cash, totaled $1,912,765 while current liabilities were $321,186. The statement showed that the company had obtained $450,000 on an authorized loan for $500,000 from the Reconstruction Finance Corp.

New Carrier Act Rate Provisions Postponed

Action Taken by ICC After ATA Rate Committee Finds Problem Solution Difficult

The effective date of provisions of the Motor Carrier Act dealing with regulation of rates, fares and charges of common carriers, filing of tariffs of common carriers, receipts of bills of lading and collection of rates and charges of freight carriers has been temporarily postponed by the Interstate Commerce Commission, administrative agency for the Act. The Act becomes effective Oct. 1, but the Commission is empowered to postpone any provisions it deems necessary.

Postponement of the provisions followed the announcement of the National Rates and Tariffs Committee of the American Trucking Association that the problem of determining the principles that shall govern determination of rates too knotty for immediate solution. At its meeting early this month in Washington the committee decided to adjourn and wait until after the ATA annual meeting in Chicago, Oct. 16 and 17, before taking up the question.

Under the terms of the Commission's postponement order these provisions are to become effective not later than April 1, 1936.

Chevrolet Forge Plant Wins Safety Trophy

Chevrolet's recent six months' accident campaign resulted in a 77 per cent reduction in accidents in the forge plant, according to company officials. A trophy was presented to William J. Scott, forge plant manager, at a recent dinner to celebrate the accomplishment. Attending the affair were C. E. Wilson, GM vice-president; M. E. Coyle, Chevrolet president and general manager, and C. E. Wetherald, general manufacturing manager.

Emery Sees "Continuing Determination" By Government to Regulate Hours, Wages

Knowledge of the affairs of the company employing him and his experiences within its plants are likely to profoundly influence the judgment of the average American workman on practical economic questions, James A. Emery, general counsel of the National Association of Manufacturers, told association members in a recent letter discussing present New Deal legislation and proposed legislation.

"The better he understands the affairs of that company," Mr. Emery wrote, "the nature of its operations, the things that make for its success or failure, the deeper will be his interest in its affairs and the more clearly he will perceive his intimate stake in the future of the enterprise. Companies which have taken the mystery out of business and translating its operations into terms of employee understanding show remarkable success in contributing to the removal of the innuendoes and suspicions which have been directed against business management."

Discussing such proposed legislation as the NRA and the pending Walsh Government Contract Bill which was backed with the full power of the Administration at the last Congressional session, Mr. Emery sees "a continuing determination to use all the tremendous powers of compulsion which the federal government may invoke to establish indirectly a general regulation of hours, wages and working conditions through the instrumentality of government contracts, loans and grants."

Mr. Emery points out that the federal government temporarily occupies a unique position inasmuch as it is the creditor of private individuals and corporations, and "to an unprecedented degree" of our states and municipalities through the disbursement of billions of public money. As a public corporation, Mr. Emery says, the government may make contracts and loans and as a sovereign it may enforce them with drastic penalties. The letter says "it is now proposed to employ this power to give business and extend credit to regulate, as the Executive may choose, the hours, wages and working conditions of all employers, dealing directly with the federal government or with all states and subdivisions thereof, which borrow from the National treasury by requiring that the subject matter of all public contracts shall be produced under discretionary executive stipulations."

Respecting the O'Mahoney Bill, sponsored by the American Federation of Labor, requiring licensing of all enterprise engaged in interstate and foreign commerce through

the Federal Trade Commission, Mr. Emery says "without constitutional amendment, the complete detailed federal control of employment relations throughout the United States is to be effected through a permit system administered and enforced by a Commission authorized to exclude the offending corporation from such commerce for non-compliance with its conditions. . . . Every private right and all local law would disappear in the all-embracing grasp of federal power."

Among the major legislative measures which the association counsel believe, as a result of study and investigation, are invalid are the Wagner Labor Disputes Act, the Guffey Act, the Agricultural Adjustment Act and the Social Security Act.

Negotiations with Canada For Alaska Road Approved

The Department of the Interior has announced the passage of a bill by the last Congress authorizing opening of negotiations with the Canadian Government for the survey, location and construction of a highway between the U. S.-Canadian boundary and Fairbanks, Alaska.

In 1930, Congress authorized the appointment of a committee to cooperate with Canadian representatives in a study of the feasibility of such a highway. This committee, as a result of data collected regarding the topography, climatic conditions, etc., of the territory through which the highway would pass, concluded that such a plan would be feasible and that substantial benefits would accrue from its construction.

H. F. McCormick Named Harvester Chairman

Harold F. McCormick has been named chairman of the board of International Harvester, Chicago, to succeed his elder brother, Cyrus H. McCormick, who has resigned to devote more time to travel and leisure. The former is 63 and the latter 76. Both have been president of the company.

Pre-Show Review of New British Models Reveal No Fundamental Changes in '36

by Marcus W. Bourdon
London Correspondent,
Automotive Industries

"No change in the fundamentals of mechanical design" sums up the developments in British cars in general that will be evident when the Olympia Show opens on October 17. Although it was anticipated a year ago by many people that the show of 1935 would see many makes of cars with independent front springing, Vauxhall is again the chief and almost only exponent of this feature at the moment of writing; and from all accounts the position will be practically unchanged when particulars of the full range of models of all British manufacturers have been made public.

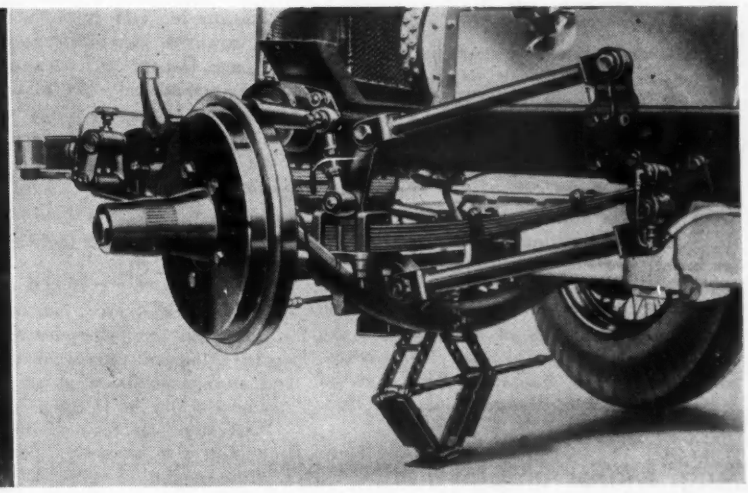
Singer, who last year produced a new model with independent springing, has not adopted the latter for any other type, but, as an option at a lower price, will actually offer orthodox front springing on the model designed for the independent system. This move of Singer's may be taken to indicate what little demand there is in the British Home market (and in the export field, also, it is believed) for independent front springing. With few exceptions manufacturers have been ready with well-tried systems for one if not two years past, but have experienced no demand that would justify such an important change of design. And there has been no imperative need to stimulate demand by producing a strong and additional sales argument, for plants mostly have been working to capacity, with extensions continuously in progress in many cases. As this implies, the British industry has again broken all previous records of output and sales.

But although no fundamental development widely adopted will be in evidence at Olympia, British cars to be shown there will, for the most part, differ extensively and obviously from the 1935 models. True, Austin—one of the two makers which outputs much in excess of any of the remainder—has introduced his 1936 models with no change apart from minor details, such as improved brakes, new steering gear and a few additional or better items of equipment. In other cases, however, the new models, some or all of them in each make, have more uniform weight distribution gained by setting the powerplant still farther forward and bringing all seating within the wheelbase, as well as longer front springs having approximately the same frequency as the rear ones; frames with side rails of box section either from end to end or at front and rear, and standard sedan bodywork with a much nearer approach to streamline form than hitherto.

Frames underslung at the rear will be more numerous at this year's show; in consequence, the average floor height will be lower and without footwells, though in the smaller sizes a propeller shaft tunnel has necessarily been retained. The lower floor height is rendering running-boards needless and this trend has allowed bodies to be made wider, almost to the full overall width of the rear fenders, from in line with the front seat rearward. This overall width extends back to the extreme rear end of the tail, which in the many so-called streamlined bodies, is formed by the roof panel sweeping back and down at an angle of, roughly, 45 deg., in keeping with the angle of the windshield. There is, of course, no novelty in this design; the point is that

(*Turn to page* 413, *please*)

Front view of 1936 Hillman Minx, a 10 hp. four-cylinder model produced by the Hillman-Humber-Commer-Karrier combine



New Daimler front springing; long and "soft" half-elliptics shackled at both ends with superimposed radius and torque rods

Medium Priced Cars Make Biggest Production Gain in First 8 Months

Passenger Car Production by Wholesale Price Classes

(U. S. and Canada)

Eight Months 1935 and 1934 Compared

	1935	1934	Per Cent Change	Per Cent of Total 1935	Per Cent of Total 1934
$500 and under	1,486,250	1,229,327	+20.9	61.00	64.99
$501-$750	860,193	570,847	+50.7	35.31	30.18
$751-$1,000	64,799	55,009	+17.8	2.66	2.91
$1,001-$1,500	14,067	23,143	—39.2	.58	1.22
$1,501-$2,000	5,780	6,333	— 8.7	.24	.33
$2,001-$3,000	3,295	5,224	—36.9	.13	.28
$3,001 and over	1,903	1,728	+10.1	.08	.09
Total	2,436,287	1,891,611	+28.8	100.00	100.00

Truck Production by Capacities

(U. S. and Canada)

	1935	1934	Per Cent Change	Per Cent of Total 1935	Per Cent of Total 1934
1½ tons and less	504,721	393,888	+28.1	94.33	92.37
2 to 3 tons	23,364	26,321	—11.2	4.37	6.19
3½ tons and over	4,160	3,787	+ 9.8	.78	.89
Special and buses	2,796	1,502	+86.1	.52	.35
Total	535,041	425,498	+25.7	100.00	100.00

Torrington - Bantam Merger Announced

Ball Bearing Company to Continue Production in Enlarged So. Bend Plant

Merger of the Bantam Ball Bearing Co., South Bend, with the Torrington company, $11,000,000 Torrington, Conn., concern has been announced by Karl L. Herrmann, general manager of the Bantam company. Rapid growth of the South Bend company and the large resources and allied business of the Torrington company led directors of the two concerns to take the step with an exchange of stock.

The statement by Mr. Herrmann said in part: "The Bantam Ball Bearing Co. will continue operations the same as heretofore in the factory at South Bend, which has been doubled in capacity by recent plant additions, but as a subsidiary of the Torrington company."

The Torrington Co., which was established in 1866, operated plants in Torrington, Conn.; Orange and Westfield, Mass.; Upper Bedford, Quebec, Canada; Coventry, England; and Aachen, Germany. As of June 30, 1935, Torrington showed a net worth of $11,000,000 with current assets of $7,850,000 and current liabilities of $681,000. Of the assets $4,830,000 are in cash and Government bonds. The Bantam company moved to South Bend from Bantam, Conn., in 1928.

Aug. Motor Employment Drops 5.3% Below July

Employment in the automobile manufacturing industry declined 5.3 per cent in August under July. Taking the three-year average, 1923-1925 as 100, the index for August was 95.3 while for July it was 100.6, according to the Bureau of Statistics, Department of Labor. The decrease in employment was attributed to a slowing down in a number of plants preparatory to production of new models. The August payroll dropped to 80.7 from 85.7.

Compared with August of last year, however, automobile employment rose 2.8 per cent and payrolls rose 4.2 per cent.

Flint Honors H. H. Curtice At Testimonial Dinner

The Flint, Mich., Chamber of Commerce sponsored a testimonial dinner Wednesday to Harlow H. Curtice, Buick president, in recognition of Buick's 1936 manufacturing and sales program. General Motors executives who attended the dinner were Alfred P. Sloan, Jr., GM president; W. S. Knudsen, executive vice-president of the corporation, and Donaldson Brown, chairman of the finance committee. The toastmaster was W. A. Gorman, editor of the Flint Journal. Mr. Sloan was the principal speaker, going to Flint from Lansing where he spoke in the afternoon.

Chrysler Enlarges Detroit Storage, Shipping Facility

In preparation for increased production of the 1936 line, Chrysler Corporation has made extensive improvements in shipping and storage facilities at its East Jefferson Avenue factory in Detroit.

First step was removal of railroad yards from Chrysler property, permitting use of a large amount of space for loading decks, paved driveways and construction of a new storage building capable of holding 800 cars. This will permit covered storage of cars that have come through the final conditioning building and are awaiting shipment.

Another improvement is the straightening out of the motor line which will result in time saving in handling of parts that go into the motor and avoid several handlings of the motor in course of construction. As rebuilt, the motor line is now a perfectly straight stretch of some 500 feet, instead of broken as in the past. The body plant also has been revamped in the interests of quality and efficiency. The various improvements have been effected under direction of David A. Wallace, vice-president.

Ford to Double Size of Canadian Plant Foundry

Less than eleven months after starting construction of an electric furnace foundry at its Windsor, Ont., plant, Ford Motor Company of Canada, Ltd., awarded the first of a series of contracts doubling the size of the foundry.

While not all details of equipment have yet been decided, it is expected the building addition and equipment will run close to the expenditure on the first unit, which was approximately $500,000, bringing the company's expansion and modernization program authorized within the year in Canada and in its overseas territories to $4,500,000.

Total structural cost is expected to be nearly $150,000, and the addition will measure 225 by 120 feet, exactly the size of the original foundry building. The complete foundry will have a floor space of 54,000 square feet, and is to be of the most modern fireproof construction. The addition is to be completed as quickly as possible, and is expected to be in partial production soon after the New Year.

It has been decided to install another automatic electric furnace for making alloy steel for casting, similar to the nine-foot furnace now in operation, but of slightly smaller size, 7 feet, 11 inches in diameter. Electricity will be provided from the company's power house, in which a $2,000,000 modernization program is now in progress, making it the largest high-pressure steam industrial plant in Canada.

Details of additional furnaces for production of alloy iron, and of molding, conveyor, heat treating and other equipment required for the complete foundry are now being worked out by the company's engineers.

Production in the foundry hitherto has been confined to the manufacture of the company's requirements of cast alloy steel crankshafts. The addition will provide for casting of brake drums and other parts of alloy steel or alloy iron.

Federal Court to Hear GM Suit Against Indiana Law

Continuation of a Federal three judge hearing to test the validity of Indiana's new retail installment sales act will be held in South Bend, Oct. 1. The case at issue is the suit of General Motors Acceptance Corp. of Indiana and the McHenry Chevrolet Corp. of Indianapolis to obtain permanent injunction against enforcement of the Act. The plaintiffs base their charge of unconstitutionality upon the allegation that the Act tends to fix prices in private business.

Output Passes 3 Million Mark

(Continued from Page 403)

built in the final quarter of 1934. This figure includes overseas assemblies of American-made motor vehicles. Not all the domestic assemblies were shipped by rail. While the projected output for the last three months of the current year is certain to exceed any fourth quarter since 1929, and may closely approximate that year's figure of 747,039 units, it will not attain the high level of earlier years. Back in 1925 the industry turned out 1,115,440 units in the fourth quarter, in 1926, 790,507 units and in 1928, 928,270 units.

Chrysler

In the 38 weeks of 1935, to Sept. 21, Chrysler dealers had delivered at retail 116,770 Plymouths and 33,206 Chryslers, a total of 149,976 cars which passes the volume for all of 1934. Plymouth deliveries exceeded the full year 1934 by 2.1 per cent and Chrysler deliveries by 23.2 per cent. During week ended Sept. 21 Chrysler dealers delivered 1695 Plymouths and 548 Chryslers.

Dodge

Dodge dealers' retail deliveries during week ended Sept. 21 were 2,856 passenger cars and 1,479 trucks or 4,335 units. Sales made by Dodge dealers between Jan. 1 and Sept. 14 of present year now are 83,519 units ahead of corresponding period last year, totaling 229,607 Dodge and Plymouth passenger cars and 43,214 Dodge commercial cars and trucks, a total of 272,821 deliveries.

Studebaker

Studebaker retail deliveries thus far in 1935 are 42 per cent ahead of last year, and registrations for August, 1935, are 92.1 per cent above those for August, 1934.

Auto-Lite To Dissolve Moto Meter Gauge Corp.

The Electric Auto-Lite Co., which owns virtually all of the common stock of the Moto Meter Gauge and Equipment Corp., and which has operated the Moto Meter plants for more than a year, is now preparing to bring the subsidiary into the parent company.

Auto-Lite has filed details of the plan with the New York Stock Exchange. Auto-Lite owns 737,314 shares of Moto Meter stock and under the plan will issue 300,000 shares of its own stock in exchange for property and assets of Moto Meter. Then the latter corporation would be dissolved and assets distributed to stockholders.

Annual Highway Research Board Meeting Dec. 5-6

The fifteenth annual meeting of the Highway Research Board of the National Research Council will be held in Washington, D. C., Dec. 5 and 6.

Cedarleaf Leaves GM

Fred W. Cedarleaf has severed his connection with General Motors of Canada at Oshawa, Ont., and returned to Detroit.

Row Crop Tractor Features Streamlines, New Engine

What is said to be the first example of styling, approaching streamlining, in farm tractor equipment is found in the Row Crop 70 tractor recently placed on the market by the Oliver Farm Equipment Sales Co.

An outstanding feature is the development of a six-cylinder, high compression engine designed to yield important operating economies on gasoline. The engine normally operates at 1500 rpm. under governor control. As an option the same engine may be equipped with special conversion features for burning kerosene or No. 1 distillate. It is provided with inserted valve seats, nickel-iron pistons, removable cylinder liners.

Full throttle operation of the engine is secured through the use of an automatic governor with variable speed control. This makes it possible for the operator to adjust the road speed of his machine simply by a twist of the operating control, varying the road speed without changing the throttle adjustment.

A high tension, inductor-type magneto, by American-Bosch, is standard equipment. If desired, the machine can be supplied with a battery ignition system. A self-starter, something new in farm tractors, is available with either battery or magneto ignition; provision is made for radio where desired.

The tractor is available with either steel wheels or air tires. An automotive type power lift, with finger-tip control from the dash, is used to raise and lower the tools. Length 141½ in., weight 3000 lb.

Jan.-Aug. Automotive Exports Increase 13% Over Corresponding 1934 Period

Exports and Imports for the Automotive Industry for August and Eight Months Ended August 1935-34

	August				Eight Months Ended August			
	1935		1934		1935		1934	
	Number	Value	Number	Value	Number	Value	Number	Value
Automobiles, Parts and Accessories	....	$15,733,705	....	$15,326,168	....	$158,549,984	....	$140,434,562
Motor trucks, buses and chassis (total)	9,997	5,547,271	7,305	3,491,629	66,576	34,534,054	63,480	29,846,113
Under one ton	1,094	387,287	761	246,855	5,872	2,018,842	6,526	2,087,281
One and up to 1½ tons	6,815	3,575,760	5,785	2,484,815	48,987	22,403,964	49,094	20,428,436
Over 1½ tons to 2½ tons	1,828	1,213,373	591	492,586	9,795	7,219,688	6,389	5,123,361
Over 2½ tons	232	339,965	127	237,266	1,532	2,560,581	1,216	2,040,326
PASSENGER CARS								
Passenger cars and chassis	10,076	5,651,607	12,522	6,905,617	120,360	67,576,055	109,378	60,296,412
Low price range $850 inclusive	9,512	5,022,311	11,455	5,787,733	111,604	58,141,199	100,338	50,356,739
Medium price range over $850 to $1,200	399	380,007	784	743,437	6,514	6,172,237	6,142	5,922,510
$1,200 to $2,000	62	95,708	139	199,932	90	1,392,767	1,591	2,431,735
Over $2,000	46	125,588	53	138,094	589	1,564,884	484	1,273,582
PARTS, ETC.								
Parts except engines and tires	....	....	....	....	....	....	....	....
Automobile unit assemblies	....	1,617,207	....	2,300,047	....	31,894,330	....	28,864,815
Automobile parts for replacement (n.e.s.)	....	2,234,174	....	1,864,948	....	17,576,789	....	14,561,885
Automobile accessories (n.e.s.)	....	240,236	....	214,350	....	1,939,712	....	1,755,514
Automobile service appliances	....	397,459	....	160,883	....	2,730,394	....	1,624,890
Airplanes, seaplanes and other aircraft	19	212,603	107	1,680,330	217	4,912,748	295	5,199,585
Parts of airplanes, except engines and tires	....	496,531	....	642,960	....	3,450,385	....	2,494,427
INTERNAL COMBUSTION ENGINES								
Stationary & Portable:								
Diesel and semi-Diesel	40	59,371	17	16,455	209	540,488	83	204,460
Other stationary and portable	....	.....	....	.....	....	.....	....	.....
Not over 10 hp.	611	42,412	533	35,991	6,562	368,466	4,023	256,232
Over 10 hp.	157	90,077	85	43,876	1,036	582,841	665	428,735
Automobile engines for:								
Motor trucks and buses	447	44,747	221	31,058	2,902	407,868	3,370	426,354
Passenger cars	413	33,114	784	55,267	18,991	1,219,579	19,478	1,211,889
Aircraft	90	486,792	77	462,022	335	1,563,544	567	2,665,442
Accessories and parts (carburetors)	....	112,026	....	129,899	....	1,084,099	....	936,964
IMPORTS								
Automobile and chassis (dutiable)	53	13,966	59	11,729	363	180,371	334	100,208

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

There were several indications last week that trade continued to improve at a relatively satisfactory rate. Retail trade registered gains throughout the country of from 10 to 22 per cent above the levels in the preceding week, while wholesale trade in most sections was better. Several industries were operating at a higher rate, while the machine tool business last month showed gains for the sixth consecutive month.

Car Loadings Move Upward

Railway freight loadings during the week ended September 14 amounted to 700,357 cars, which marks a rise of 107,571 cars above those in the preceding week, an increase of 52,871 cars above those a year ago, and an increase of 40,271 cars above those two years ago.

Chain Store Sales Gain

Sales of 25 chain stores, including two mail order houses, during August were about 12 per cent above those in the corresponding period last year. Sales of the two mail order houses alone increased 21 per cent. There was an increase of 10 per cent in the dollar volume of business of these 25 companies in the first eight months of this year, as compared with that in the corresponding period in 1934.

Current Production Increased

Production of electricity by the electric light and power industry in the United States during the week ended September 14 was 11.9 per cent above that in the corresponding period last year.

Cotton Consumption Greater

Cotton consumed in the United States during August amounted to 466,272 bales, as against 453,908 bales in the preceding month and 480,054 bales in the corresponding period last year. Cotton spindles active during August numbered 22,046,652, as against 24,181,776 a year ago.

More Crude Produced

Average daily crude oil production for the week ended September 14 amounted to 2,749,850 barrels, as against 2,660,200 barrels for the preceding week and 2,488,100 barrels for a year ago.

Irving Fisher's Index

Professor Fisher's index of wholesale commodity prices for the week ended September 21 stood at 85.2, as against 85.1 the week before and 84.5 two weeks before.

Federal Reserve Statement

The consolidated statement of the Federal Reserve banks for the week ended September 18 showed a decrease of $1,000,000 in holdings of discounted bills. Holdings of bills bought in the open market and of government securities remained unchanged. Monetary gold stocks increased $21,000,000, and money in circulation declined $6,000,000.

API Proposes Model Gas Tax Law to Halt Evasion

Adoption of a "sound model gasoline tax law by every state" as a means of preventing gasoline tax evasion has been recommended by the American Petroleum Industries Committee in its second annual report made public at a recent New York meeting of the northeastern district of the committee. The proposal carries thirteen provisions, recommended as efficient means of eliminating tax evasion.

The 13 methods are 1, licensing of distributors and filling stations, with provision for cancellation for violation; 2, bonding distributors; 3, reports from all common carriers transporting the fuel; 4, retention of records by distributors and dealers for two-year period; 5, all records to be available for inspection; 6, reports of monthly tax paid by all companies to be available for inspection (now available in all but 11 states); 7, amount of tax to be lien in favor of state against all property of person failing to pay; 8, failure to pay to constitute embezzlement of public funds, punishable by fine and imprisonment; 9, reports to tax administrator of all transfers or sales or cessation of business; 10, rewards for detection of violation; 11, refunds (if necessary because of local conditions) to be given only to persons who secure permits specifying the equipment in which exempt gasoline is to be used; 12, severe penalties for all violations as in case of income tax law; 13, requirements for exchange of information by the states as to shipments leaving each state

Carbondale Announces Officers, Directors

Carbondale Machine Corp., Harrison, N. J., recently reorganized as a subsidiary of Worthington Pump and Machinery Corp., to cover the manufacture and sale of all classes of refrigeration, ice manufacture and air conditioning equipment, has announced officers and directors as follows: H. C. Ramsey, president; H. A. Feldbush, vice president; A. H. Baer, vice president in charge of sales; A. L. Prentice, secretary and treasurer; W. Lehman, assistant secretary and treasurer; F. D. Talmage, assistant secretary and treasurer; C. A. Packard, comptroller. Directors: A. H. Baer, H. C. Beaver, Hugh Benet, H. A. Feldbush, H. C. Ramsey, C. E. Searle, C. E. Wilson.

GM of Canada Inaugurates Safe Driving Campaign

General Motors of Canada have introduced a "Drive Carefully Campaign" among its employees. Distinguishing discs are awarded for having driven without accident for various periods. As the status of drivers is based on a retroactive record, there are already 80 per cent who have qualified for the gold disc, the award for a full year's driving without accident.

Toledo Car, Truck Sales Lead City's Business

Automobile and truck registration in Toledo increased 48 per cent over the total for the corresponding months last year and was the largest single gain of any business in Toledo. The city's business generally showed a nine per cent increase for the three months under review in comparison with the same 1934 months.

Armour Inst. Gives Course in Industrial Management

A course in industrial management for executives and persons with supervisory responsibilities in industry will be given by Armour Institute of Technology, Chicago, commencing Sept. 30. Norman B. Schrieber will deliver 15 weekly lectures on all functions of plant operation, coordinated with sales, distribution and advertising.

Metal Products Exhibit Section Opens in N. Y.

The first section of the Metal Products Exhibit—the first permanent exhibition of metals and plastics in this country—was opened to the public last week in the International Building, Rockefeller Center, New York. This exhibition, under the direction of Metal Products Exhibits, Inc., is designed to provide a comprehensive review of metallic and plastic materials and parts as used by industry.

New Catalog Issued

The Toledo Steel Products Company announces a new catalog covering their complete line of valves and valve parts. The catalog contains all 1935 information and listings on valves, valve guides, springs, keys and valve inserts manufactured by this company for all types of automobiles, trucks, buses and tractors. Copies may be secured from The Toledo Steel Products Company, Toledo, Ohio.

Pre-Show Review of New British Models

(*Continued from page 409*)

hitherto it has not been used for standard sedans of popular powers and prices.

The box frame sides are channels with plates welded on and are being used generally with cross-bracing, to regain rigidity at the front end that was lost in recent years by the flexibile mounting of the engines.

Shifting the engine farther forward again has called for modifications in the steering layout. This implies the steering gear housing set near or actually at the extreme front end of the frame alongside the radiator shell, with the drag-link running either back to the stub axle arm on the same side or across to the opposite side. In either case, the coupling rod has gone to its old-time position in front of the axle in order to be clear of the engine sump. Another steering development extended greatly for 1936 is the adjustable steering column, whereby the height of the wheel can be varied instantly, even while running.

Undoubtedly the more uniform weight distribution and the softer front springs have improved the suspension in general; on small cars in particular there is a marked reduction in fore-and-aft pitching on rough roads. Daimler has developed the idea of a single brake torque rod at each side of the front axle, used by two or three British manufacturers of recent years, and has shackled the long front springs at both ends and fitted a pair of parallel torque and radius rods at each side.

Seating within the wheelbase has not been provided in all cases without reducing the space between front and rear seats of sedans: the latter have become "close-coupled," but with four doors and six lights. Two-door coupes will figure much more extensively at Olympia this year, but they differ notably from the original conception of a coupe body, being practically a close-coupled two-door sedan with a long extension in the form of a luggage and spare wheel locker. In the new streamlined bodies the tail encloses luggage space, which is generally given access from the body interior by lifting the hinged back-rest of the rear seat.

Additional makers will be using the Girling mechanical brake for 1936, a feature of which, it may be recalled, is that all the operating parts are in tension—none in torsion. Synchromesh and preselective transmissions will hold their own, the former being the more extensively used, but a trend back to three speeds from the four that were practically universal last year may be started by the fact of the new Morris range throughout having three speeds only. Free-wheels will be harder to find at Olympia, though Rover retains one with an ordinary (non-synchromesh) transmission after a remarkably successful two years.

Equipment will be found even more comprehensive on 1936 models. Morris and Austin have adopted hydraulic four-wheel jacking (the Jackall integral system), and it is likely to be seen on other makes at the show, as well as the D.W.S. and Stevenson integral jacking equipments and a new loose jack design to lift through abutments on the front and rear bumper brackets by means of a ratchet spanner applied to the top end of the long stem.

An unusual policy for British manufacturers is being adopted by several of them this year, viz., announcing only a part of next year's range of models well in advance of the opening of Olympia, keeping back one or more as last-moment surprises. Among these is Daimler, who will announce a new straight-eight chassis for light sedan and coupe bodywork with outstanding performance; this will supplement the straight-eight introduced last year for limousine and landaulet bodies and will be additional to a range of Sixes that includes a Light Twenty put on the market during the past summer. But even with this further new Daimler, the eight-cylinder engine will remain exceptional in British practice.

Although Morris, Wolseley, Hillman and one or two other prominent makers will have 20-25 h.p. sixes at Olympia at prices which will have more appeal in both home and export markets, it will be clearly evident again, as for many years past, that the predominant demand among British buyers is for small cars ranging from 8 h.p. to 10 h.p. Despite the reduced rate of taxation now in force (15s instead of 20s per rated horsepower) the large and low-priced car has not yet and does not seem likely to gain in favor to any notable extent; in other words, the output of the British industry for the home market will continue to consist of about 60 per cent of 8 to 10 h.p. cars, and only 20 per cent above 14 h.p.

Mexican Border Residents Can Buy U.S. Cars Duty Free

The Mexican National Congress has enacted a new law permitting residents of towns and cities on the Mexican side of the boundary line between that country and the United States to buy automobiles in this country and take them into Mexico with payment of duties, provided such residents live within 20 kilometers of the boundary and intend keeping the cars within that area. However, should the owners take the cars elsewhere in Mexico outside the 20 kilometer limit they will have to pay the required levies.

To encourage American tourist travel in Mexico a provision in the same law rescinds the requirement that a bond be posted for all automobiles entering the country at United States border gateways.

Ford Broadcasts Resume Over CBS Sunday, Sept. 29

With Jascha Heifetz, as guest soloist for the inaugural program, the Ford Sunday Evening Hour broadcast series will be resumed Sunday night, Sept. 29. The program, sponsored by the Ford Motor Co., will be broadcast each Sunday evening from 9 to 10 E.S.T. for a period of 39 weeks over a coast-to-coast network of the Columbia Broadcasting System. W. J. Cameron, of the Ford Company, will continue his intermission talks throughout the series.

Pontiac Field Men Meet To Discuss 1936 Program

Pontiac's field staff from all regional and zone cities throughout the country met this week in Pontiac and Detroit for a two-day sales convention with company executives. Thursday morning was spent at the GM proving grounds at Milford while trips through plants occupied the afternoon. Plans and policies for the coming year were discussed and the merchandising program for 1936 considered at the Friday sessions.

New S. S. White Offices

The Industrial Division of the S. S. White Dental Mfg. Co., which handles all the industrial products manufactured by the company, has moved its offices to 10 East 40th Street, New York City. George T. Latimer is division manager.

CALENDAR OF COMING EVENTS

SHOWS

New York Automobile Show, New York, Nov. 2-9
Baltimore Automobile Show .....Nov. 2-9
San Francisco Automobile Show..Nov. 2-9
Washington, D. C. Automobile Show, Nov. 2-9
Detroit Automobile Show .....Nov. 9-16
Buffalo Automobile Show .....Nov. 9-16
Indianapolis Automobile Show....Nov. 9-16
Newark Automobile Show .....Nov. 9-16
Cincinnati Automobile Show ....Nov. 10-16
Pittsburgh Automobile Show.....Nov. 11-16
Philadelphia Automobile Show..Nov. 11-16
Chicago Automobile Show.....Nov. 16-23
Minneapolis Automobile Show....Nov. 16-23
Columbus Automobile Show ....Nov. 22-28
Cleveland Automobile Show ....Nov. 23-30
Montreal Automobile Show .....Nov. 23-30
Kansas City Automobile Show, Nov. 30-Dec. 6
Milwaukee Automobile Show.Nov. 30-Dec. 6
Automotive Service Industries Show—Atlantic City .....Dec. 9-13

CONVENTIONS AND MEETINGS

American Society for Metals, Annual Meeting—Chicago .....Sept. 30-Oct. 4
American Welding Society, Chicago, Sept. 30-Oct. 4
Empire State Automobile Merchants Association, Albany, N. Y. ....Oct. 8-9
S.A.E. Transportation Meeting, Chicago .....Oct. 10
S.A.E. National Tractor Meeting, Chicago .....Oct. 10-11
National Safety Council, Louisville, Ky. .....October 14-18
American Trucking Associations, Inc., Chicago .....Oct. 14-15
American Gas Association — Atlantic City .....Oct. 14-18
Industrial Materials Exhibit, Hotel Astor, New York .....Oct. 21-25
Los Angeles .....Nov. 2- 9
S.A.E. Annual Dinner, New York....Nov. 4
Newark, N. J. .....Nov. 9-16
American Petroleum Institute — Los Angeles .....Nov. 11-14
Philadelphia .....Nov. 11-16
International Acetylene Association, Cleveland .....Nov. 12, 13, 15
Baltimore .....Nov. 2-9
National Industrial Traffic League—Chicago .....Nov. 20-21
Columbus, Ohio .....Nov. 23-28

The Horizons of

Permanent Unemployment

IN the lush literature of the New Deal no subject has been more severely abused than unemployment unless it be the social merit of the wealthy. We may start off with three early fall estimates of the idle. The American Federation of Labor states the total at 11 million, the National Industrial Conference Board at 10 million and the Alexander Hamilton Institute at 13 million. If we assume that the country has 50 million men and women able and willing to work it follows that one out of every four or five workers is now without a job.

The record, such as it is, shows that this proportion has not changed appreciably during the past three years. The country has it on the highest possible authority that the ratio of idle to toilers will not improve in the future even though business recover to its 1929 prosperity level. Conclusion: The country has a permanent relief problem of approximately present proportions on its hands. This is not a pleasant picture.

The Toolmaker

Nor is it helped by the specious prescription of William Green. According to the A. F. of L. leader the fault lies in the rapid technological progress of industry which replaces men with machines. If the machine increases the output per man and thus releases workers the obvious preventative of further unemployment is the reduction in the hours of work and the spread of effort among the original group of workers. Such is the rationalization of the 30 hour week demand of organized labor which has recently received exalted official cognizance even though the short work week remedy of labor was not accepted in the same encyclical.

The theory that one-fifth of our workers will remain permanently at leisure, that this is the result of improved industrial processes, that no recovery in sight during the next four or five years can materially reduce this army of the idle is a mischievous and gratuitious conclusion masquerading as a profound observation of authentic fact.

Fragile Premises

In the first place the figures cited must be accepted with reservations. They are but agile estimates of the leaping variety. They purport to measure not the number of men and women actually on jobs but the number who are not on jobs on the basis of a prior and admittedly imperfect estimate of those who do work. The frailty of the figures is indicated by the fact that one of the estimates is 30 per cent larger than the other. There is no intention here to disparage or ridicule the efforts of those who have provided the figures. They have done the very best which the fugitive statistical material on the subject will permit. Only by the most heroic leaps through the air can any final estimates of unemployment be produced.

Our complaint is that an inherently unreliable figure should be used as the basis, in one case, of a prediction that the country will be forced indefinitely to support an army of 11 million idle, and, in another, that industry must submit to a 30-hour week. The prediction and the plea are typical of the current insistence that the land embrace the most far-reaching social and economic experiments upon the most fragile of factual premises.

What Is Industry?

The unemployment in almost every discussion of the subject is attributed to industry. It is assumed that industry is guilty of the technological progress which has forced these 11 million men and women out of work, that further similar progress will keep these workless workers idle, a recovery of production to pros-

Business

By Joseph Stagg Lawrence

perity levels notwithstanding.

Since industry is the alleged culprit it may be well to define the term. As generally used it refers to the production of tangible goods on a large scale with the aid of machinery and power. It does not include agriculture, trade, clerical occupations, domestic and personal service, public service, or professional service. These exceptions are quite important because they bulk large numerically, because some of them show an increase in employment relative to population, because they are comparatively free of technological taint and finally because the technocratic pessimists, naively or deliberately, omit them from their alarming calculations of future distress.

The Farmer

It is quite necessary to consider these exceptions. During the past 25 years the number of gainfully occupied in agriculture has remained practically stationary. In fact the total of those who make a living on the farm has increased during the depression years. The farm accounts for 21.3 per cent of those gainfully occupied. The toolmakers cannot be blamed for the unemployment of farm workers since there is none. However it might be argued that if the toolmakers had not been so ingenious, if management had not been so avid in its search for the better mousetrap at a lower cost, if capital had not been available to finance large scale production of agricultural machinery, the farm today would afford more jobs. Here is the argument. In 1870, 52.8 per cent of all those gainfully employed worked on the farm. Today a little more than 20 per cent make a living on the farm. If one-half of our laboring population today had farm jobs there would be no unemployment.

Ignoring for the time the emancipation of the farmer from the cruel drudgery of his ancestors, has capitalism and its handmaiden, the machine, provided compensation in terms of working opportunities elsewhere? The simplest and most conclusive answer is that 32.4 per cent of the population was gainfully occupied in 1870 as against 39.8 per cent in 1930.

Labor can see the loss of a specific job when a new machine is introduced. It cannot see the far-reaching compensations of the innovation.

Some Facts

Labor today charges industry with responsibility for the 11 million workers which it believes to be unemployed because it is in industry that the most striking technological improvements have been made. In 1870 our mechanical and manufacturing industries gave employment to 2,674,000 workers. In 1930 the aggregate payroll showed 13,790,000 workers. If technological progress during the past five years accounts for the 11,000,000 idle, employment in industry today must be roughly equal to the total in 1870. However official indexes show that industrial employment is roughly back to 80 per cent of the 1929 level. On the other hand if productivity, due to technological advances, has increased 20 per cent and five men today do the work of six in 1930, then the toolmaker has displaced only 2,300,000 workers and not 11,000,000.

There is another difficulty in this technological job-larceny theory. The greatest unemployment is to be found in construction work, particularly residential construction work, where the trade union remedy of output limitation has been most generously applied and where the machine has made little progress. It would seem therefore that the activity of the toolmakers cannot be charged with the permanent unemployment of 11,000,000 workers. Nor is the summary remedy of the 30-hour week indicated.

Three Entirely New 40 in Buick's 1936

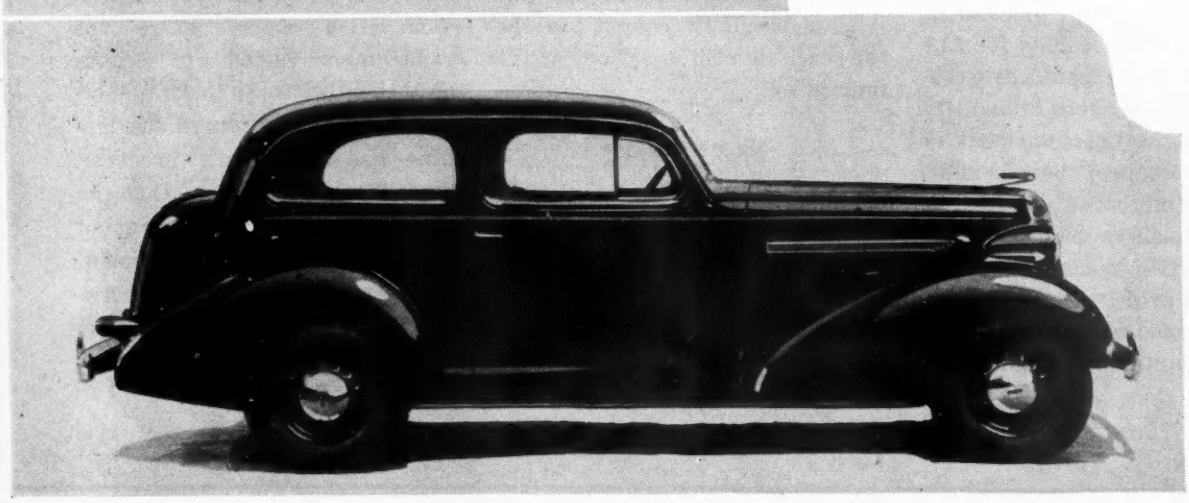
by Don Blanchard

THREE entirely new cars, designated as the 60, 80 and 90 respectively and all powered with a new 120 hp. engine, and an improved and longer model 40, make up the line for which Buick has set a 1936 production quota of 135,000 units. Prices are lower than last year on all models.

The entire line is featured by high performance both in top speed and acceleration, and this is particularly true of the three larger cars all of which out-perform the 40 which in 1935 was Buick's best performer. The improved performance of the larger cars, however, has not been obtained at the expense of gas and oil economy as the new jobs are markedly better in this respect than last year.

All 1936 Buicks now have anodized alloy pistons, dual downdraft carburetors, front end timing chains, hydraulic service and mechanical emergency brakes, turret tops with the exception

The new frontal appearance adopted for the 1936 cars



The Century (60) two-door sedan illustrating the lines of the 1936 Buicks

Series and an Improved Line—Prices Are Lower

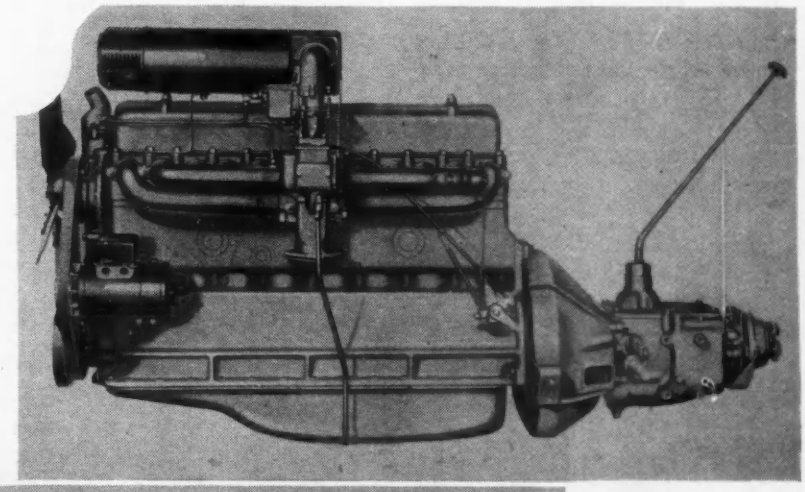
New 120 hp. engines give 60, 80 and 90 series unusual performance—All models have new body styling, turret tops, anodized aluminum pistons and hydraulic brakes

of the convertibles, built-in trunks on the sedans, sway stabilizers at the front, stiffer frames with convertible frames being further reinforced, lower tire pressures, 50-50 weight distribution and softer spring action.

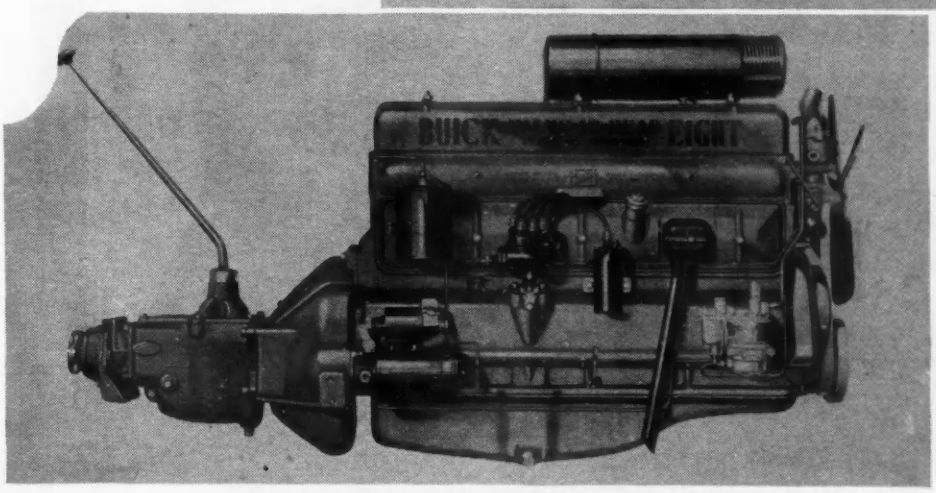
The new attractive body styling marks a departure from previous Buick practice as the accompanying illustrations show. Bodies have more leg, elbow and head room, the increase in front seat width being 3½ in. or more on a number of the sedans.

Manufacturing, merchandising and service problems have been simplified by a reduction in the number of body styles from 25 to 14, the use of the same engine, clutch, and transmission in the three larger cars and other similar changes reducing the number of different parts and units required by the cars. In addition large savings in weight have been made in the 60, 80 and 90 by careful design and by reducing the wheelbase on the 60.

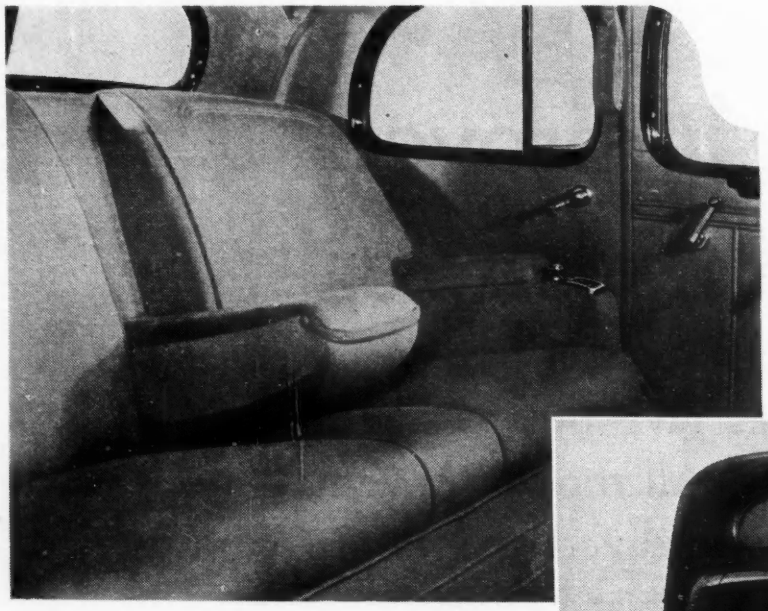
Using the sedans as a basis of curb



Left side of new 120 hp. powerplant showing downdraft carburetor, manifolding and belt-driven generator

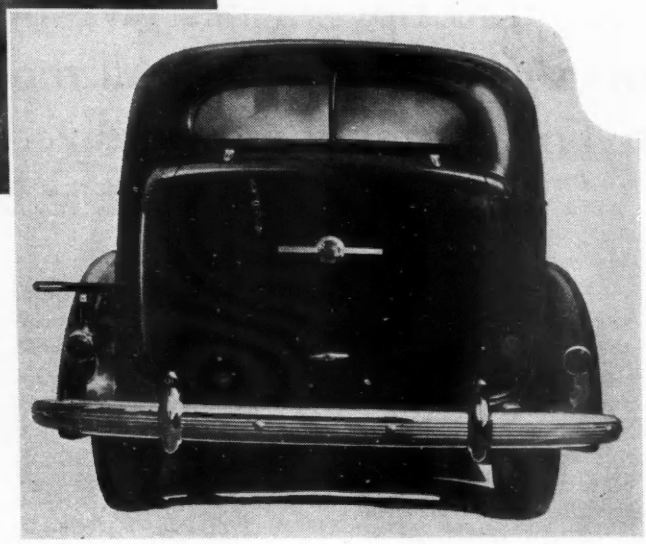


Right side of new 120 hp. powerplant



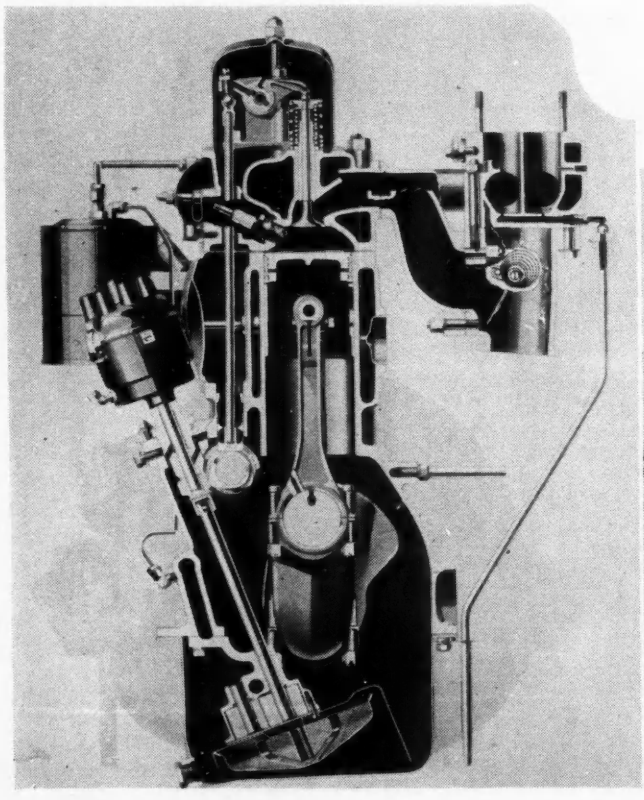
Rear seats have folding center arm rests in the 80 and 90

weight comparison, the weight of the 60 has been reduced 551 to 4004 lb. and the wheelbase decreased from 128 to 122 in.; the weight of the 80 is 4379 lb. and since there was no 80 in the line last year, the weight of this 131 in. model may be compared with 5110 lb. for the 1935, 136-in. wheelbase 90; the 1936 model 90 has a 138 in. wheelbase and weighs 4768 lb. against 5110 lb. last year. The wheelbase of the 40 has been increased from 116 5/16 to

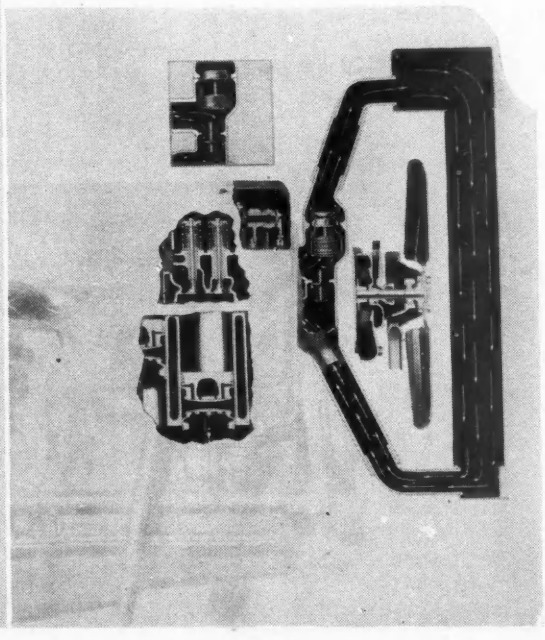


All 1936 Buick sedans have built-in trunks and turret tops

Transverse section of new 120 hp. engine. Note the new piston type valve lifters



Cooling system details. Water circulates through a tube in the hollow rockershaft. Oil surrounding this tube is thus warmed up more quickly, which shortens the time required for the pushrods to reach operating temperatures



118¼ in. and its weight has gone up from 3405 to 3534 lb. mostly due to the greater length and a rise in body and tire weights.

These savings in weight in the 60, 80 and 90 models in combination with the 120 hp. developed by the new engine at its peaking speed of 3,200 and its maximum torque of 238 lb. ft. at 1600, explain the following factory performance figures; Model 60, top speed 95 m.p.h. and acceleration from 10 to

Specifications of the 1936 Buicks

F.O.B. Prices
Buick 1936 Models

Model Name	Model No.	1936 List Price	Reduction
Series 40 Special—118-in. Wheelbase			
Four-door, 5-pass. sedan—with built-in trunk	41	$885	$50
2-pass. business coupe — with deck	46	765	40
4-pass. sport coupe—with opera seat	46 S	820	45
4-pass. sport coupe—with rumble seat	46 S	820	45
4-pass. convertible coupe—with rumble	46 C	905	30
Two - door, 5 - pass. victoria coupe—with built-in trunk	48	835	40
Series 60 Century—122-in. Wheelbase			
Four-door, 5-pass. sedan—with built-in trunk	61	1090	385
4-pass. sport coupe—with opera seat	66 S	1035	350
4-pass. sport coupe—with rumble seat	66 S	1035	350
4-pass. convertible coupe—with rumble seat (fender well only)	66 C	1135	370
Two - door, 5 - pass. victoria coupe—with built-in trunk	68	1055	350
Series 80 Roadmaster—131-in. Wheelbase*			
Four-door, 6-pass. sedan—with built-in trunk	81	1255	*
6-pass. convertible phaeton—with built-in trunk (fender well only)	80 C	1565	*
Series 90 Limited—138-in. Wheelbase			
Four-door, 8-pass. sedan—with built-in trunk (fender well only	90	1845	210
8-pass. sedan—limousine—with built-in trunk (fender well only)	90 L	1945	230
Four-door, 6-pass. sedan—with built-in trunk (fender well only)	91	1695	270

All 1936 prices include safety glass all around, whereas an extra charge of $10 was made on 1935 sedans.
* There was no Series 80 in the 1935 line.

Engine

Specifications of new 320 cu. in. powerplant engine used in 60, 80 and 90 Buicks

Bore	3 7/16 in.
Stroke	4 5/16 in.
Displacement	320.2 cu. in.
Compression ratio	5.45
Max. output	120 at 3200
Max. torque	238 at 1600
No. of suspension points	5
Crankshaft	5 bearing with eight integral counterweights and harmonic balancer
Main bearing diam. and length	
Front	2 9/16 x 1 9/32
No. 2	2⅝ x 31/32
3	2 11/16 x 1 15/32
4	2¾ x 31/32
5	2 13/16 x 2 15/32
Main bearing material	Babbitt with steel back
Crankpin diam. & length	2¼ x 1 5/16
Big end bearing material	Babbitt—spun in
Camshaft drive	Link-Belt
Generator drive	Fan-belt
Pump and fan drive	Fan-belt
Piston material	Anodized aluminum
Compression rings	Two—⅛ in. wide, corner groove
Oil rings	Two—5/32 in. wide
Piston pin	¾ in. diam., locked in rod
Connecting rod length	8¼ in.
Valves—intake	Nickel Chromium, 1 25/32 in. diam.
exhaust	Silchrome No. 1, 1 7/16 in. diam. with copper plated stems
Lubrication	Pressure to mains, rods, camshaft, timing gear and valves
Oil filter	AC
Relief valve opens	45 lb.
Fuel pump	AC driven from camshaft
Carburetor	Stromberg dual downdraft EE-22, 1 7/16 in.
Heat control	Thermostatic
Choke control	Delco-Remy automatic
Air cleaner and silencer	AC
Water temperature control	Thermostat and by-pass
Battery	Delco, 120 amp. hr.
Distributor	Delco-Remy with octane selector and vacuum and centrifugal advance
Spark advance	26-30 deg. at 2600
Spark plug	AC 18 mm.
Generator	Delco-Remy ventilated, third brush and voltage control
Starter	Delco-Remy with mechanical (Solenoid) engagement

Clutch

Make	Long, single plate, 11 in. diam. with 8 springs in vibration neutralizer and 12 pressure springs.
Facing size	11 in. O. D. and 6½ in I. D.
Pedal pressure	33 lb.

Transmission

Type	Synchromesh.			
Gears	All helical, nickel chrome steel.			
Ratios	2.66, 1.7, direct, and reverse 3.07.			
Wheelbase	118 in	122 in.	131 in.	138 in.
Front tread	56⅛	58⅛	59 13/16	59 13/16
Rear tread	57½	57½	60½	62½
Max. width	70⅝	70⅝	75	75
Car height at curb weight	70¼	70¼	70⅝	71½
Rear axle reduction	4.444	3.9	4.222	4.555
Toe-in	1/16 to ⅛ in. on all models			
Caster—degrees	3-3½	1¾-2¼	1¾-2¼	¾-1¼
Camber	¼ neg. ¾ pos. all models			
Steering gear	Saginaw worm and double roller all models			
Steering gear ratio	20.8	22	22.8	22.8
Min. turning circle	39	41	44	48
Wheels	Motor Wheel—steel spoke artillery all models			
Tires	16 x 6.50	15 x 7.00	16 x 7.00	16 x 7.50
Tire pressure	26	26	28	28
Service brake	Bendix hydraulic all models			
Lining width	1¾	2	2	2
Brake drums	Centrifuse	Ribbed C. I.	Ribbed C. I.	Ribbed C. I.
Braking area	159 sq. in	181 sq. in.	181 sq. in.	215 sq. in.
Per cent rear braking	48.5	48.6	48.6	47.3
Location of hand brake	Under dash on all models			
Hand brake operates	Rear service shoes all models			
Front coil spring diam.	.603 in.	.672 in.	.692 in.	.713 in.

Fuel Economy

Models		40 1936	40 1935	60 1936	60 1935	80 vs 60 1936	80 vs 60 1935	90 1936	90 1935
Miles per Gallon	at 30 M.P.H.	19.0	19.0	15.5	14.5	15.5	14.5	15.1	13.0
	at 50 M.P.H.	15.5	15.5	14.2	11.9	13.5	11.9	12.6	11.0
	at 70 M.P.H.	12.5	12.5	11.5	9.5	10.5	9.5	9.5	9.5

Oil Consumption

Average of 20,000 Miles High Speed Driving

		40	60	80	90
Miles per Quart	1936	325	300	275	275
	1935	325	150	150	150

60 m.p.h. in 19.6 sec.; Model 80, top speed 90 m.p.h. and acceleration from 10 to 60 m.p.h. in 20.7 sec.; Model 90, top speed 87 m.p.h. and acceleration from 10 to 60 m.p.h. in 21.4 sec. The top speed of the 40 remains at 85 m.p.h., but its acceleration is slightly better between 10 and 60 m.p.h., having been reduced from 21 to 20.7 sec. It will be noted that the three larger cars are faster than the 40 and that only the 90 has less acceleration. Fuel and oil economy figures are given in comparative form in the accompanying table.

The new engine used in the three larger cars is a short stroke, 320 cu. in. valve-in-head eight weighing 843 lb., as compared with 1008 lb. for the 345 cu. in. 116 hp. engine used in last year's 90 and with 901 lb. for the 278 cu. in. powerplant in the 1935 model 60. The bore and stroke of the new engine is 3 7/16 x 4 5/16 in., the latter figure comparing with a 5 in. stroke in last year's 90 engine and giving a considerable reduction in piston speeds and crankpin loads.

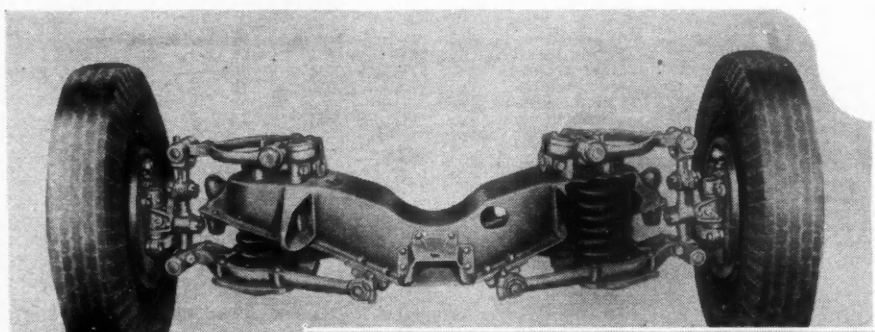
The adoption of Anolite pistons, of course, has further reduced bearing loads, the weight of the piston-rod assembly being 3.86 lb. against 5.43 lb. in the former 90 engine. Accelerated connecting rod life tests at high speeds on the Proving Ground indicate two to three times as long life for the rod bearings in the new engines, while piston and pin wear tests show equal or less wear than with last year's tin-plated equipment. Oil economy is unchanged on the 40, but is increased from 150 to 500 miles per quart under varied driving conditions in the new engine as compared with last year's 90 engine.

A number of new features have been incorporated in the valve operating mechanism on this engine as well as on the 40. Ported pistons made of chilled iron are now used as valve lifters instead of the roller design formerly employed. Another development on the new 120 h.p. engine is designed to warm up the pushrods more rapidly. To this end, water is circulated through a tube in the rocker shaft. The oil lubricating the valve mechanism circulates in the annular space surrounding this tube and hence reaches normal operating temperatures more quickly. Consequently when it flows down over the pushrods it warms them up faster. None of the Buicks this year have oil coolers, presumably due in part to the reduced bearing loads and also to the fact that full length water jackets are provided. The water pump has been redesigned by putting ball bearings on the front end of the shafts on the new engine, and the top radiator tank capacity has been increased.

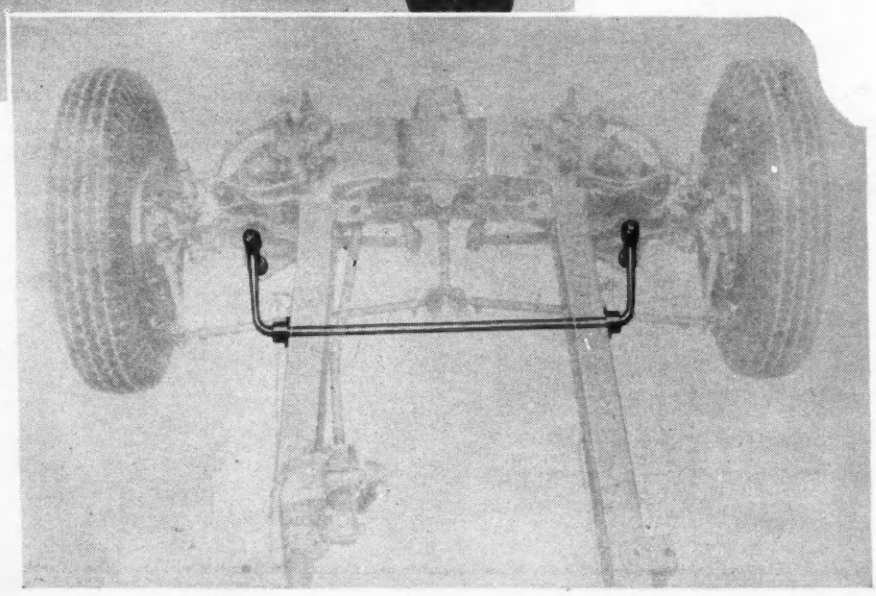
The 60, 80 and 90 all have 11 in. single plate clutches with spring segments between the plate and the woven facings to soften engagement. The clutch throwout mechanism is mounted on the flywheel housing and connected directly to the clutch. The transmission on these cars also is an entirely new design which in general is patterned after the unit used in the 40. It is more compact and weighs 36 lb. less. The ratios are 2.66, 1.7 and direct, with a reverse reduction of 3.07.

The torque tube, propeller shaft and rear axle are identical on the 60 and 80 except for differences in length and final reduction. The rear axle used on these two jobs is a new semi-floating design with a two pinion differential. The final reduction ratio is 3.9 on the 60 and 4.222 on the 80. The pinion shaft is mounted in a ball bearing at the front and a roller bearing at the rear. The 90 axle is carried over from last year and has a reduction of 4.55 to 1.

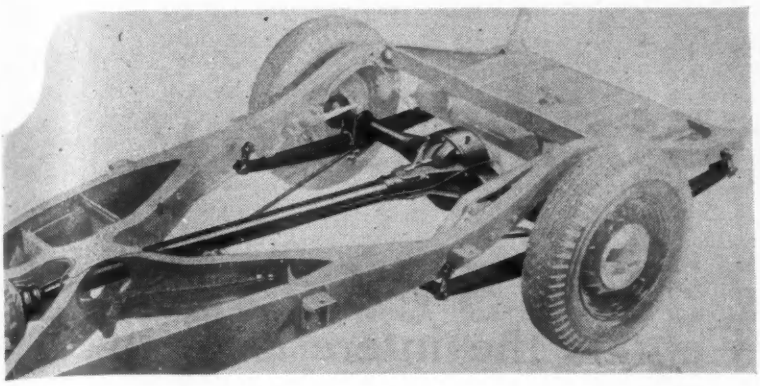
Rubber insulation is provided between the rear axle and springs on all models. The axle is mounted 4½ in. ahead of the center of the spring thus making the rear portion of the spring 9 in. longer than the front. This is said to compensate for the greater movement at the rear end of the springs and to give uniform flexibility. The coil front springs are softer and also shock absorbers are adjusted for



Softer springs, shaft supports for inner ends of lower wishbones, and a box-section cross member are new front end features



Sway stabilizers are now located at the front end of the car.



The rear axle is offset on the springs to give better riding. This view also shows the stiff frame construction

softer action. On the larger cars, the front end suspension has been modified to conform to the design adopted on the 40 last year.

The torsional rigidity of the frames has been increased on all models and at the same time weight has been reduced except on the 40. The 40 frame is 10 lb. heavier and 26 per cent stiffer. On the 60, weight has been reduced 68 lb. while stiffness has been more than doubled. The weight saving on the 90 amounts to 33 lb. with a 144 per cent increase in stiffness. The increased rigidity is due to the addition of shear plates and the wider use of welded joints. Special frames are provided for convertible models giving them from 57 to 80 per cent more stiffness than last year. These frames have heavier side rails and X-members, and larger plates at the intersection of the X. On the larger cars, the frames are all patterned after the design used on the 40.

Aside from the new hood and body styling and the innovations already mentioned as common to all Buick 1936 models, the series 40 has been changed mainly in detail. The fact that in a very general way it was used as a pattern for the changes in the new 60, 80 and 90 series indicates that Buick engineers regarded it as a pretty satisfactory job as it was. However, its wheelbase has been increased from 116 5/16 to 118¼ in. This increase in size together with heavier bodies is mainly responsible for raising the curb weight of the sedan from 3405 to 3534 lbs.

The adoption of Anolite pistons has cut the weight of the 40-rod-piston assembly from 3.84 to 2.99 lb. with a consequent reduction of crankpin loads at the power peak speed from 2120 to 1290 lb. The compression ratio has been stepped from 5.45 to 5.55 on this model and the maximum torque from 175 in. lb. at 2220 to 183 in. lb. at 1900. Maximum power, and fuel and oil of the 40 are unchanged, and the same is true of top speed and acceleration.

The same type of choke is now used on the 40 as on the larger cars. It is featured by a sealed cast-iron body, a large well to prevent gumming of the metering pin, and an adjustment for fuel volatility. To reduce vapor locking troubles, the gasket between the carburetor and the manifold has been increased from 1/16 to 9/16 in. and the carburetor jet is vented so that vapor rising can escape without going through the jet. The valve lifter mechanism has been changed to conform with the design used in the new engine installed in the larger cars.

Shock absorber bodies on the 40 have been strengthened to make them stronger than the arms so that the latter, which are less expensive to replace, will give in the event of collision, thus protecting the shook absorber against damage.

Both the clutch and the transmission have been improved in detail. The clutch diameter is 9½ in. and it is faced with woven instead of molded material. Instead of being rippled, the clutch plate is now flat and sprung segments are inserted between the plate and the facing. The throwout mechanism has been redesigned to reduce friction and the equalizer is now located ahead of the rear engine support arm where it may be lubricated and adjusted from under the hood.

An interesting electrical feature on all models is an arrangement which makes it possible to operate the starter only when the ignition switch is closed, thus making it impossible to use the starter to move the car.

New Gardner Diesel

What appears to be a new model of the Gardner Diesel engine, specially designed for mounting in a passenger car, was subjected to a test by a member of the Autocar (England) staff recently. It is a four-cylinder engine of 3¾-in. bore and 5 5/16-in. stroke, which makes the displacement 232 cu. in. A compression ratio of 14 to 1 is used, the engine developing 63 hp. at 2000 and 83 hp. at 3000 r.p.m. With electric starter it weighs 684 lb., and to make this light weight possible it was necessary to make extensive use of light alloys.

The cylinder block is cast of an aluminum alloy and has hardened cast iron liners inserted in it. The cylinder heads (cast in pairs) are of the same material and have a bronze plate cast in, in which the valve and injector seats are formed. The Gardner engine is of the direct injection type, an air swirl being produced in the combustion chamber by deflectors on the inlet-valve heads. The piston heads are slightly cupped. A specially light alloy is used for the crankcase, in which the 3-in. crankshaft is supported in five and the camshaft in six bearings. The crankshaft is machined from the solid slab and has counterweights attached to the arms. Fuel injection is by a Gardner-Bosch pump and Gardner injection valves.

In the tests a fuel mileage of 42 per Imperial gallon was obtained, the car weighing slightly over one and one-half long tons (3400 lb.). The average speed during the test was 30 m.p.h.

Correction

In the Sept. 14 issue of *Automotive Industries* Alupak, a product of the Felt-Products Co., Carroll Avenue, Chicago, was referred to as Alukak. Alupak is the correct spelling.

Metal Congress and Show

Centers the interests of five national societies at Chicago Amphitheatre

THE National Metal Congress, one of the outstanding industrial events of the season, will be held this year in Chicago Sept. 30 to Oct. 4, inclusive. This is the seventeenth event of the kind to be held in succession, and, besides, this year's congress is expected to be the largest in five years. As usual, five national societies will hold their meetings during the convention, all of them interested in metals and metallurgical subjects.

The show is being held in the International Amphitheater, Forty-third and Halstead Streets. There will be 25 per cent more exhibitors at the show than last year, and more than 164,000 sq. ft. of floor space will be covered with exhibits, including both the main exhibition hall and one wing of the amphitheater. The show will open every day at noon and remain open till 10 p. m., except Thursday, when it will close at 6 p. m., on account of the banquet of the Society of Metals. The exhibits will include, in addition to samples all of various materials used in the metal-working industry, all sorts of equipment used by the industry, such as furnaces, machine tools, testing instruments, heat-treating and welding equipment. A good many of the exhibits will be shown in operation.

164,000 Sq. Ft. of Floor Space for Exhibits

Among the technical societies to hold their meetings at the convention there is first of all the American Institute of Mining and Metallurgical Engineers. The Institute will not meet as a whole but two of its Divisions, the Iron and Steel Division and the Metals Division, have scheduled separate sessions. On Tuesday and Thursday the sessions will be at the Palmer House, while the Wednesday meeting will be held at the International Amphitheater. The Iron and Steel Division will hold a "round table" on "The Qualities of Pig Iron," in which it is planned to discuss in an informal way the advances made in this field since the first round table on the same subject, in 1927. A second round table will be inaugurated with two formal papers on "Temperature Measurements of Liquid Iron and Steel." The Metals Division will have sessions on "Reactions in Alloys and Gas-Metal Systems." At the Institute dinner on Wednesday evening Doctor Urey, discoverer of "heavy water," will talk on "Recent Developments in Isotopic Chemistry."

High-temperature properties of metals occupy a prominent place on the program of the American Society of Metals, two whole-day sessions being devoted to this topic. On Wednesday afternoon a group of papers dealing with various aspects of the grain-size problem will be presented, at a meeting in the International Amphitheater. Other sessions will be devoted to tool steels, steel making, metallography, and research. There will be a technical session at the Palmer House every day at 10 a. m. and at the International Amphitheater every day at 2 p. m. No more than three papers will be presented at any one session, which is expected to leave plenty of time for discussion. Following the business meeting of the A. S. M. at the Palmer House on Wednesday morning, H. W. McQuaid, of the Republic Steel Corporation, will deliver the annual Edward De Mille Campbell Memorial lecture. Besides being an authority on the subject of grain size, Mr. McQuaid is a well-known specialist in gear steels and case hardening, and presumably the lecture will relate to a subject of importance in these fields.

Aside from the conventional papers and their discussion, there will be two series of educational lectures at the convention. At the International Amphitheater Dr. Marcus A. Grossmann, of the Illinois Steel Co., will lecture every day on the heat treatment of steel, at 4:30 p. m., while a course on spectrographic analysis will be given at the amphitheater by Dr. E. J. Martin, of General Motors Corporation Research Division, on Monday, Tuesday and Wednesday at 7:30 p. m.

Twenty-two papers have been secured for the seven technical sessions of the American Welding Society, which will hold its fifteenth fall meeting at the convention. The first session on Monday afternoon will open with the induction of the president of the Society, an address of welcome, the presentation of the Miller Memorial Medal Award, and two technical papers. The other sessions will be devoted to fundamental research in welding, general subjects, a symposium on Methods of Minimizing Distortion and one on Low Alloy Steels for Welding Purposes.

Annual Banquet Thursday

A dinner meeting of the Board of Directors will be held on Monday at 6:30, and the annual banquet on Thursday evening at the Palmer House.

No technical sessions will be held on Friday, the day being given over to inspection trips to various plants in and around Chicago, where varied applications of welding will be seen. Two routes will be arranged and provision made to accommodate both groups at lunch time.

In addition to the organizations mentioned, the Wire Association will hold meetings at the convention. It will have its headquarters at the Congress Hotel, while the headquarters of all of the other societies will be at the Palmer House.

Arrangements have been made also for a number of factory visits by the American Society of Metals, and among the plants to be inspected is the Alemite and die-casting division of the Stewart-Warner Corporation.

JUST AMONG OURSELVES

Wealth-Sharing, Coolidge Style

WHILE the "Share-the-Wealthers" in and out of the Administration try, if they will, to tell us what wealth is and who has it, we all might well consider the beneficial effects of increased income. What we all want is more "spending money." Tax-ridden landlords and dividendless stockholders, for example, know that wealth is not necessarily that. They have their slices of wealth, but what of it?

So far, at least, the New Deal prescription for the cure of depressions has comprised two chief ingredients, restriction and repression. What some of us think we need is a good stiff dose of stimulation, something to help us get back to where we were in those years of prolific productivity when everyone had more loose change in his pockets than he has today.

Get our national production and our national income back to where they were in 1929, say we, and, as Sam Dunn has pointed out, the aggregate incomes of those who were receiving less than $1,500 a year will be increased by fifteen billion dollars.

The increase alone will be five times greater than the aggregate income of all those who at present get more than $25,000 annually. A restoration of the 1929 national income, looking at it another way, will give nearly thirty-five billion dollars, in the aggregate, to those who had incomes of less than $25,000 in 1929. That—the increase only—is ten times as much as all those who now have incomes of more than $25,000 get, in the aggregate, in a year.

Major L. L. B. Angas, the British author of "The Coming American Boom," told us this week in a speech at Boston that the "third phase" of the New Deal is all but on us. In this "third phase," he said, the President's policy will probably be "to out-Coolidge Coolidge in giving industrial prosperity to America."

If the Major proves to be a good prophet we shall be able, after a time, to record that the New Deal finally found the correct solution for its own "Share-the-Wealth" problem.—J.C.

Italy Going Off Gasoline

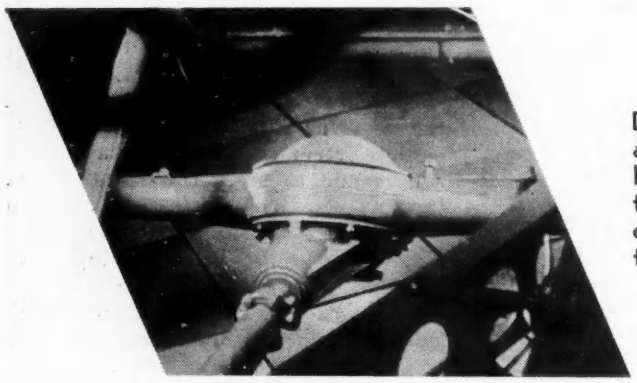
EVER since the war various European countries have been seeking substitute fuels of native producton for use in motor-propelled transportation units. The most promising substitute from the operating standpoint seemed to be benzol, but that was never available in sufficient quantities even in countries with large coal mining industries. Later attention was turned to alcohol, which also would meet requirements fairly well if it could be produced in adequate quantity and sufficiently cheap. Occasionally there has been an overproduction of industrial alcohol and the price of the product dropped so low that it could compete commercially with the heavily-taxed gasoline; but this never lasted very long, for when there is an overproduction of anything the producer usually suffers, and he does not hesitate to take steps to remedy the situation. Therefore, on the basis of heat units contained, alcohol usually has been more expensive than gasoline, and where it has been used to any extent it has been forced upon car-owners by the governments.

More recently attempts have been made to solve the motor-fuel problem by using producer gas. France for a great many years now has been paying bonuses and granting relief from taxation to owners of commercial vehicles operating on producer gas and satisfying certain military requirements, but in spite of these "encouragements" the producer-gas truck has made little progress in commerce and industry. So far as fuel cost is concerned, the producer-gas truck probably effects a material saving, but it appears that this is more than made up for by the decrease in the power generated when an engine is operated on gas, the greater loss in time when starting in the morning, and the greater amount of servicing required by the gas generator and its accessories.

Italy now has made the use of generator gas or other gasoline substitutes obligatory upon all operators of motor vehicles engaged in the commercial transportation of passengers after Dec. 31, 1937. It has been reported recently that gasoline is selling in Italy at around a dollar a gallon. This high price, which, of course, is due chiefly to high taxation, must be a great handicap to the development of commercial transportation. As Italy imports her coal as well as her petroleum fuels, it is not immediately apparent what she stands to gain by this restriction, but it is probably figured that a certain number of heat units imported in the form of coal require less foreign exchange than an equal number in the form of crude oil, and especially in the form of gasoline.

—P. M. H.

Packard 120-B Is More



Differential carrier and housing have been reinforced to take care of the increased engine torque on the 120-B

WHILE the 1936 120-B Packard is fundamentally the same car as its predecessor, a considerable number of detail improvements have been made which combine to improve performance, economy and riding comfort. Externally the appearance of the car differs only in details, but inside body finish is completely new.

On the 14th series cars, which include the eight, super eight and twelve, the frontal appearance has been changed to conform to the current trend in styling. Mechanical changes affect only the electrical equipment, the clutch throwout and the oil cooler on the twelve.

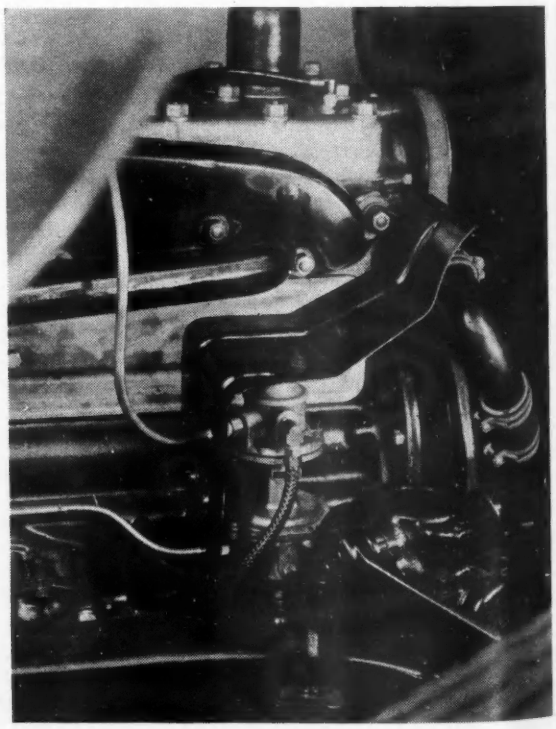
Taking up the changes in the 120-B in detail, the stroke of the engine has been increased ⅜ in. to 4¼ in., raising the piston displacement from 257 to 282 cu. in., the power output from 110 to 120 hp. at 3800 r.p.m., and the maximum torque to 225 lb. ft. at 2000 r.p.m. With the longer stroke, the weight of the crankshaft has been increased 5 lb. to 95 lb., while the rods have been shortened 3/16 in. and the big end stiffened to provide a better support for the bearings. Timing chains are ¼ in. wider, the new width being 1¼ in.

With the increased engine power, the standard rear axle ratio has been reduced to 4.09 from 4.36. With this new ratio and the shorter rods, bearing loads are reduced for any given car speed. Moreover, acceleration and fuel and oil economy are better than last year.

A new and more efficient radiator core has been adopted for 1936, resulting in an increase in cooling of 20 per cent at low speeds. As a safeguard against vapor lock, a shield has been placed over and in back of the fuel pump to stimulate air circulation. As a part of this construction, which is shown in one of the illustrations, a hole has been cut in the side pan directly under the pump. Muffler design has been improved in detail to reduce exhaust noises.

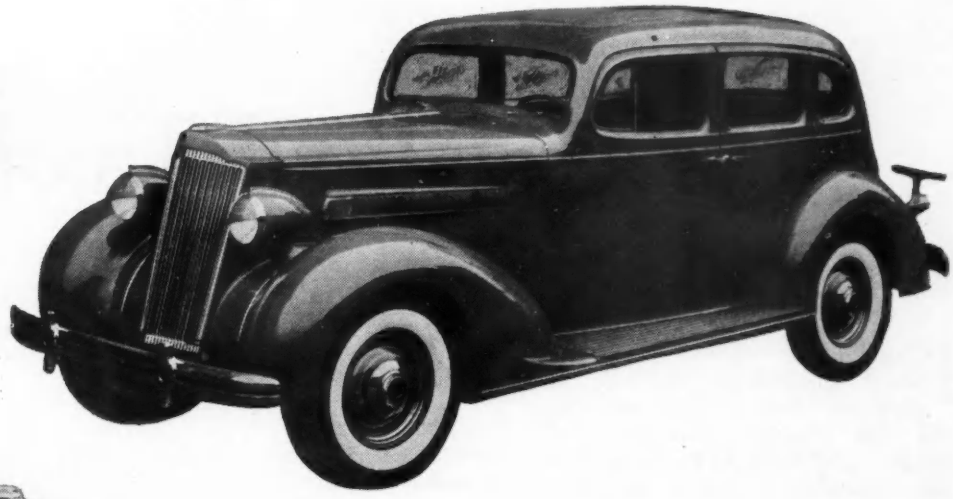
The clutch is substantially unchanged, although new friction facings are used and the cushion springs have been modified for softer engagement. In the transmission a spring has been added to urge the shifter lever toward the right side and the leverage of the shifter has been changed to shorten the shift. The differential carrier and the differential housing have been reinforced and wheel bearings are of greater capacity. The hand brake is more accessibly located under the dash, its leverage has been increased and an equalizer replaces the cross-shaft formerly used. A worthwhile reduction in tire noise has been obtained by increasing the thickness of the steel in the wheels by .02 in.

The independent front suspension has

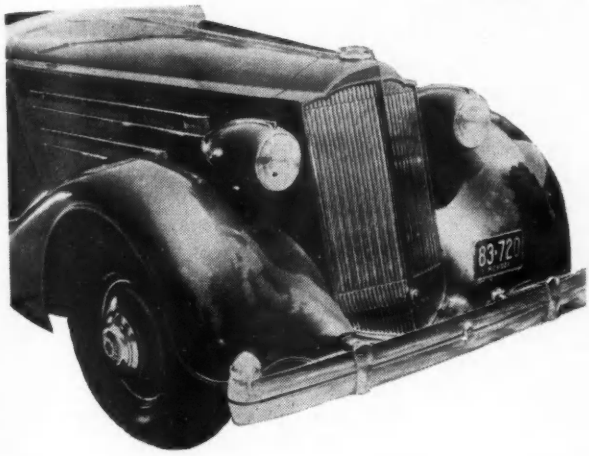


Shield place over and in back of the fuel pump to promote air circulation and thus to guard against vapor lock. There is a hole in the side pan directly under the pump

Powerful



Packard 120-B sedan. Note the upper door front hinge is concealed



The new frontal appearance of the 14th series cars

The upper hinge shown is a new design which permits hinging the door at the front despite its inclined edge. When the door is closed the upper hinge is entirely concealed

not been changed except that the spring rates have been reduced from 90 to 75 lb., and the rubber bearings at the upper end of the vertical wheel support and at the rear of the radius rod have been softened. Rear spring leaves now have tapered ends to reduce friction and to give more uniform deflection. Shock absorbers have been recalibrated and the valves now have double orifices and narrower seals to reduce noise; in addition, piston and cross-shaft fits are closer.

To make smooth driving easier, the throttle control has been redesigned so that the first 20 per cent of accelerator pedal travel gives 8 per cent of throttle opening; formerly the first 20 per cent gave 18 per cent of opening.

A new radiator emblem embodying the traditional Packard bale has been adopted. Bumpers are new and are fitted with heavy guards. The bumper supports have been strengthened and the rear bumper is 2⅛ in. lower than formerly.

While maintaining the familiar sloping line at the front edge of the front door, this door is now hinged at the front as the result of an interesting development in concealed hinges which one of the accompanying illustrations show. The new design also has permitted lowering the fender-well carriers, giving a better appearance. Exterior hardware is heavier and the right front door handle carries the lock.

Inside the bodies, new but less delicate shades of upholstery are used with narrower pleating. Seat cushion springs and contours have been improved. Door and window regulators are more conveniently located and the trim mouldings have a grained walnut finish. Front compartments have 1 in. more leg room and the adjustable seat control is more accessible. Rear compartments in all sedans are 1½ in. wider due to changes in the wheelhouses and arm-rests, while headroom has been increased ¾ in. in the touring and standard five-passenger sedans. All sedans have foot-rests built into the back of the front seat.

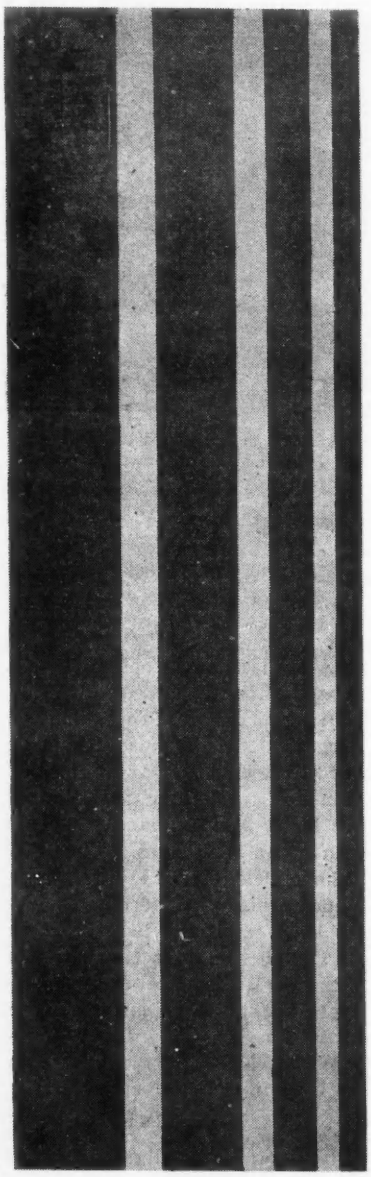
On 14th series cars, the radiator shell has a greater slope and has been made narrower at the bottom than at the top. Front fenders are less blunt. Bonnet sides are lower and the lamp brackets have been given new lines. The 1936 line will have Delco-Remy ignition units with octane selectors. Generator fan design has been improved to give more cooling. Clutch throwout bearings are now of the sealed, permanently lubricated type, but as a precaution these bearings will receive additional lubricant from the chassis lubricator. The oil cooler unit on the twelve is now the same as on the eight, and an AC full-flow oil filter is used.

Diesel Fuel Taxable in 30

by Joseph Geschelin
Detroit Technical Editor,
Automotive Industries

IN the modest beginnings of truck Diesel applications, the fuel was absolutely free of tax restrictions and that, of course, was one of the things contributing to the phenomenal fuel economies on heavy duty equipment.

As the interest grew, people began to question the stability of fuel prices, they began to wonder whether a tax would be slapped on, and if so, how much and when. Naturally there was the usual amount of guessing by many experts.



Well, we have just completed an investigation that rubs out the IF.

Statistically the answer is found in Table 1, which gives the YES or NO and how much, based on replies from officials in every State in the union.

Analyzing the official returns, we see definitely that 30 States of the 48, or 61 per cent, recognize Diesel fuel as a regular motor fuel and impose a fuel tax. Quite contrary to previous guesses, the amount of Diesel fuel tax is precisely the same as the gasoline tax. And much to our surprise California has no tax although we had been led to believe more than a year ago that this State would have a tax schedule just double that for gasoline.

One-third of the total, 16 States, have no tax on Diesel fuel and no machinery for collecting it, except in several special cases mentioned later. Of the 16 NO's, Alabama and Kansas are confident that the gasoline tax rate can be imposed under the present law, if and when enough Diesel fuel is used to justify the bookkeeping involved. Two other States, New Jersey and Virginia, are surveying the situation and are prepared to report to the Legislature on an amendment to the law if necessary. South Dakota is not sure whether the present law covers Diesel fuel and has started suit through the Attorney-General's office to get an official ruling. Louisiana has been looking it over. There is no specific tax on Diesel fuel but if and when the gasoline tax receipts suffer because of an increase in Diesel usage, they will put through a law immediately.

But there is a fly in the ointment! Vermont and Utah have turned a neat trick to "encourage" the use of Diesel transportation equipment on the highways and byways of the two sovereign States. Vermont enacted an emergency act—Temporary No. 144—which reads as follows:

"It is hereby enacted by the General Assembly of the State of Vermont:

"Section 1. Section 4986 of the Public Laws is hereby amended by adding thereto a new paragraph to read as follows:

" 'Non-gasoline driven motor vehicle' shall include all motor vehicles, the power for which is generated otherwise than by gasoline, except steam road rollers, tractors used entirely for work on the farm and vehicles running only upon rails or tracks.

"Section 2. The annual fee for the registration of any 'non-gasoline driven motor vehicle,' as defined in Section 4986 of the Public Laws as amended by the preceding section of this act, shall be twice the amount of the annual fee provided for a motor vehicle of like classification and weight under the terms of Chapter 209 of the Public Laws as the same is now or may hereafter be amended.

"Section 3. This act shall take effect from its passage.

"Approved April 2, 1935."

So the registration fee for a Diesel-powered vehicle is to be just double that of gasoline vehicles.

Neither Utah nor Vermont have fuel taxes but Utah will "encourage" Diesel transportation by charging a special toll of 1½ cents per operating mile on Diesel vehicles. And this is over and above other normal vehicle taxes, except the fuel tax. It takes effect Jan. 1, 1936.

Now if we run back over the evidence we find that of the 16 NO's, six are on the fence and it's just a question of time before they swing over to the YEAS.

On the basis of our survey it becomes obvious that the only reason for leaving Diesel fuel tax-free is either because the usage of this fuel has been no factor in a given State or because there has been no noticeable drop in gasoline revenues. The only State that stumps us in generalizing so broadly is California which is practically the

0 States Under Present Laws

birthplace of Diesel transportation in the U. S. A.

Another reason for ducking the Diesel fuel tax issue in some States is that, generally, the usage of the fuel on the road has been negligible and the bookkeeping involved in a check-up would be economically futile. The difficulty is that there is a heavy traffic in distillate fuels of various kinds and it is quite a burden to segregate the little bit that may be used at present for Diesel vehicles.

However, there are ways of doing these things if it's worth while. For example, both Illinois and Washington nick the Diesel operator by collecting the tax directly from the user rather than by collecting through the wholesalers. In this case, of course, it is presumed that the tax collector has a record of every Diesel vehicle operating on the highway. Wisconsin, on the other hand gets its cut by requiring the dealer to account for all sales of Diesel fuel known to be for consumption in road vehicles. Kentucky requires the wholesale dealer to pay the tax.

Not all States in the YES column mention Diesel fuel specifically in their tax law. However, in all cases except those that have been singled out in the foregoing, the law as written is sufficiently broad to cover any kind of fuel used in an internal combustion engine. Typical of this is the statement from the Revenue Agent of Arkansas who says in part, "any fuel used in the operation of motor vehicles over the highways of this State, regardless of the name by which it is known, is taxable to the State as a motor vehicle fuel."

To sum up the situation, 30 States definitely TAX Diesel fuel; and six of a group of 16 are on the fence, ready to switch whenever expedient. Only two small States are unaccounted for—New Mexico, and Tennessee. But this won't affect the story to any extent.

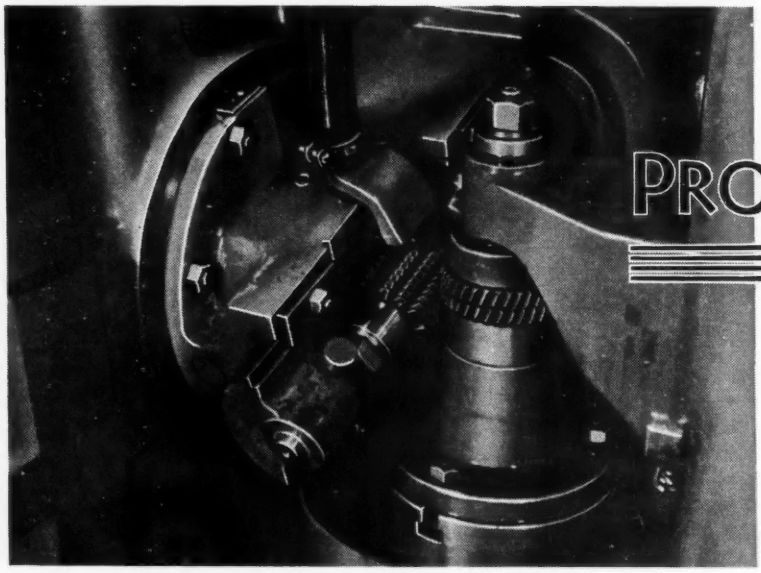
The only disturbing factor so far as future prospects are concerned, is the possible spread of special taxation such as Vermont and Utah have adopted. However, there is little point in crossing bridges before we get to them and the situation may never arise.

What does this mean so far as the economic future of the Diesel is concerned? For one thing we can forget the guess work and realize definitely that the cost of Diesel fuel must include a normal tax. Fleetmen as well as Diesel makers will have to take this into account in calculating the operating economy of a projected Diesel application.

But there is nothing disturbing about it. For the present the price of Diesel fuel plus tax still is lower than the cost of gasoline, and in some locations it's a good deal lower. However, even if the cost of the two fuels were to become identical, a good Diesel installation will justify itself on the basis of inherent fuel economy which should net a profit of at least 35 to 50 per cent on the fuel bill.

Table I

STATE	Gasoline Tax Cent Per Gallon	Diesel Fuel Tax Cent Per Gallon
Alabama	6	No
Arizona	5	5
Arkansas	6½	6½
California	3	No
Colorado	4	4
Connecticut	2	2
Delaware	4	4
District of Columbia	2	2
Florida	7	No
Georgia	6	No
Idaho	5	5
Illinois	3	3
Indiana	4	4
Iowa	3	3
Kansas	3	3
Kentucky	5	5
Louisiana	5	No
Maine	4	No
Maryland	4	4
Massachusetts	3	4
Michigan	3	3
Minnesota	3	3
Mississippi	6	6
Missouri	2	2
Montana	5	No
Nebraska	4-5	4-5
Nevada	4	4
New Hampshire	4	No
New Jersey	3	No
New Mexico	5	—
New York	4	4
North Carolina	6	6
North Dakota	3	No
Ohio	4	4
Oklahoma	4	4
Oregon	5	5
Pennsylvania	4	4
Rhode Island	2	No
South Carolina	6	No
South Dakota	4	No
Tennessee	7	—
Texas	4	4
Utah	4	Special
Vermont	4	Special
Virginia	5	No
Washington	5	5
West Virginia	4	No
Wisconsin	4	4
Wyoming	4	No



PRODUCTION LINES

Skid-Load

Acme Steel has developed a new method of shipping strip steel in coils and cut lengths by skid loads. Coils of strip are bound together in unit-loads to facilitate loading, shipping, unloading, and storing. A novel feature of the plan is that if the customer does not have the mechanical equipment to handle the skids, a lift truck is shipped along with the first carload. It's shipped on trial—if you like it, you buy it. Nothing like keeping up with the times.

Paint-Light

To some people the idea of painting up the plant is just an economic waste. They can't see anything productive in it. Those that haven't been sold on the idea should take a walk through the AC factories. Good light, bright paint are in evidence everywhere. What profit? Well, AC won the G.M. safety award for five month's no accident record this year. A goodly part of this is due to the psychological effect of good housekeeping. Paint and light certainly pay dividends.

Through Edge

Watch for a new and doggy instrument panel designed for one of the new 1936 cars. Chief feature of the panel aside from its good looks is a unique lighting arrangement. We might mention that the dials are printed right on the glass plate. Here is the idea. The glass is mounted in a metal plate, as usual, but illumination is afforded by light coming through the edge of the glass rather than underneath or overhead or something else. They found two ways of carrying light rays through the edge of the glass—either by a highly polished edge or a very rough edge; they chose the latter since it gives the same effect at little cost.

Newest Ingredient

Another chemical has taken its place in industry. For many years, the metallic element, Columbium, was merely a laboratory curiosity. Recently, however, important researches have shown that it is extremely beneficial when added to stainless steel.

Now, when stainless steel is to be welded, metallurgists and designers can specify columbium-treated stainless steel welded with a columbium-treated welding rod. — *Electromet Review.*

Small Traces

Report has it that Prof. George R. Harrison of M.I.T. has developed a quick and positive method of identifying minute traces of sulphur and selenium. While his research has been aimed at the agricultural field. it is expected that the method will be invaluable in detecting selenium and sulphur impurities in alloys and metals. Doctor Harrison employs infra-red rays in his spectroscopic analysis, which is said to bring out the detail of sulphur and selenium bands more sharply.

Seventy Years

Our best wishes to E. F. Houghton organization which is celebrating its 70th anniversary this year. The House of Houghton has been serving the metal working industries since the Reconstruction Era way back in '65.

Air Conditioned

One of our contributors tells us that his company sees the practicability of cooling passenger car interiors with water-ice. If you are working on air-conditioning maybe they can give you some ideas. Call on us if interested.

Better Grinds

Great improvement in grinding finish is achieved by using a centrifugal clarifier in the coolant system. DeLaval has developed a centrifuge which has had a successful record of performance in several automotive shops. The use of this method eliminates scratches on fine finishes, permits grinding nearer to finish dimensions, permits more pieces per dressing of wheel. A real production setup is described in *Grits and Grinds* for August.

Men Only

Koebel Diamond has this unique title for a little booklet on grinding kinks and the care of grinding wheels. Be sure to get a copy of it if you have anything to do with precision grinding.

Lost Art

You have heard a lot about Mallory 3 metal. It's predominately copper, has the strength of structural steel, the conductivity of copper, and in general all the ideal qualities for many special applications. The whole story is told briefly in a new booklet that we can get for you.—J. G.

MANUFACTURING MANAGEMENT METALLURGY

AUTOMOBILE QUIETING

Part 2

Part I was printed in the August 17, 1935, issue of Automotive Industries.

by John S. Parkinson*

Figure 1

Relative Vibration Velocity Levels of Various Panels

Description of Panel	Vibration Velocity Levels in Decibles* Right	Left
Top of Hood	87	85
Top of Front Fender	87	88
Front Door	80	79
Front Door Window	80	80
Rear Door	83	79
Rear Door Window	86	82
Roof Cove above Front Door	78	78
Roof Cove above Rear Door	77	78
Top of Rear Fender	80	80
Side Panel above Rear Fender	84	84
Side Rear Window	84	84
Windshield	86	87
Floorboard—Front	85	84
Floorboard—Rear	82	84
Cove above Rear Window	69	
Toeboard—Front Right	79	
Dash—Passenger Side—Right	74	
Dash—Engine Side—Right	80	

*The threshold of reference corresponding to 0 db. in this case was a velocity of $.7 \times 10^{-4}$ cm./sec. The vibrations in the above tabulation may be converted to actual velocities from the formula:

Reading in db. $= 20 \log 10 (V_1/V_0)$, where V is the velocity in cm. per sec. corresponding to the reading and V_0 is the reference velocity.

ALL noise originates in vibrating bodies. Where these bodies vibrate at a considerable amplitude, and where considerable areas are coupled to the air, a large quantity of sound energy may be given off. For example, in designing loud speakers the effort is to make the speaker cones as light as possible, in order that for a given energy input a considerable amplitude of vibration may be attained; and large cones, often with baffles, are employed to obtain a large area of vibrating surface. When we consider the automobile we realize that in many ways its evolution has unconsciously followed those patterns by which more and more sound energy is generated in the air, that is, an engine which year by year is more powerful and a body which is becoming lighter. Contained in this body are large areas of fairly light metal, for the most part unbraced and undamped, which are readily set into vibration.

To attack the problem intelligently, it is necessary either to cut down the vibrational energy of the source, to isolate this vibrational energy from the large surfaces of frame and body, or, if these surfaces are set into oscillation, to prevent this vibration from reaching the ear. There are, then, several possible methods of attack. Improvements in design have resulted in a motor and driving mechanism which is far better balanced and which vibrates less, in spite of the increased power. To this extent the engineers in charge of motor design have themselves contributed materially to the solution of the problem. In recent years we have seen the advent of resilient motor mountings which have further assisted in correcting the condition. More efficient springs and the presence of resilient pads or supports between frame and body would likewise seem to offer possibilities for noise reduction. The recent trend in design which tended to make the body an integral part of the frame and to make the body members themselves structural parts of the frame would seem to have been unfortunate from the standpoint of noise. Since it will never be possible to avoid engine vibration and road shocks, the frame and chassis should, if possible, be isolated from the body itself.

It is interesting to note that noise is always more annoying when it is coupled with a vibration which is perceptible. If, for example, the observer raises his feet from the floor of a railroad train or automobile, thereby preventing the transmission of vibration directly through his body, there will be a very distinct reduction in the amount of noise which he perceives. Accordingly, any means by which vibration is prevented from entering the car body will be doubly beneficial.

In this connection it is interesting to refer to the tabulation in Fig. 1, which shows the vibration velocities obtained at various parts of a four-door sedan. The rear wheels of the sedan had been jacked up and the engine was turned over in high gear at a speed corresponding to approximately 30 m.p.h. The readings are related to an arbitrary threshold and are accordingly only to be considered relative to each other. As might be expected, the large metal panel on the top of the hood and the front fenders had the largest vibration velocity. Among the panels which might conceivably be generating sound energy within the body, the windows and the floor were among the worst offenders. In this particular instance it was possible to measure the vibration on both sides of the dash and to determine the efficiency of the dash insulation in this way. It will be seen that in this case the vibration velocity was reduced from 80 to 74 decibels. It is characteristic of this car, as of a number of other cars which have been examined, that the panel above the rear fender at the side of the car was one of the largest sources of vibration energy.

Among the methods of reducing noise within the automobile, we have already mentioned the desirability of resilient engine mountings and improved spring suspension. Stream lining the body re-

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duces noise, since air turbulence tends to set panels, particularly windows, into vibration and thereby creates its own particular kind of noise. These various approaches to the problem, together with the proper design of intake silencers and mufflers, belong naturally in the field of design and as such are within the province of the automotive engineer. There is, however, another type of quieting which relies upon sound reducing materials. This is a field which hitherto has been somewhat outside the province of the automotive engineer. Among such materials may be included sound absorbent treatments for body interiors, sound insulating treatment for dash and toe and floor boards, damping materials, and vibration insulating materials. One might also include anti-squeak and gasket materials. Because of the function of these products, it has been difficult to write proper specifications, and in some cases they have been sold to the motor car industry without due regard for their actual merits.

Before any thorough analysis is made of the properties desirable in these materials, it is necessary to consider the character of the noise encountered in an automobile, particularly with respect to frequency. Various frequency analyses have been made of cars in actual service, and for the most part the results are quite consistent. In Fig. 2 is presented an analysis made on the same car for which the vibration measurements were obtained shown in Fig. 1. The levels given are loudness levels, adjusted for ear sensitivity. The speed in this case was 50 m.p.h., but the distribution of energy was essentially the same at all speeds. The only significant difference observed in other similar experiments is that at high speeds the principal energy sometimes is found in the next higher band—256-512. In general, it may be said that the frequencies in automobile noise which sound loudest to the human ear lie between 100 and 500 cycles. Actually, there is a large body of energy at the very low frequencies, but because the ear is relatively insensitive at these frequencies this fact is not of great significance in automobile quieting. It is interesting, though of course not surprising, to note that a frequency analysis of the vibration from a typical body panel shows approximately the same distribution of energy as is shown in Fig. 2. This tends further to corroborate our theory that practically all the energy which one hears within the automobile is generated by the vibrations of the various surfaces.

The material most widely used for noise quieting in other fields is the sound absorbent. Such a material, instead of reflecting sound energy, converts this energy into heat and thereby dissipates it. In view of the considerable quantity of sound absorbent material already present in the car in the form of carpets, seats, and upholstery, the question has been asked whether the addition of further sound absorbent material could be expected to produce any practical improvement. If no pains were taken in selecting the material or its location, such a criticism would be entirely valid. If, on the other hand, the sound absorbent material selected is efficient and in the band of frequencies which are important, namely, 100 to 500 cycles, and if care is taken to locate it in those areas where measurement shows the energy to be at a maximum, it is reasonable to expect a material improvement. The writer has made tests on one car in which less than 7 sq. ft. of material installed in the critical areas produced an improvement which was both measurable and audible. The absorption frequency characteristic of this material is reproduced in Fig. 3 together with (the dotted line) absorption frequency characteristic of the common type of sound absorbent material used in building construction. Most of the familiar absorbent materials have practically no efficiency in the range most important for automobile quieting. Special designs are necessary to obtain proper results.

In specifying a sound absorbent material it is necessary, therefore, to consider not only weight and thickness and the more familiar quantities, but also its efficiency at these frequencies, and this efficiency should be included as an integral part of the specification. It should also be borne in mind that in low frequency absorption the method of application will be as important as the nature of the material itself. If a material is bought to meet a certain specification, the manufacturer furnishing the material should be consulted before any change is made in the method of installation.

The materials which are installed in the dash are intended to prevent the transmission of noise from the engine into the passenger compartment. In the terminology of the acoustical engineer, they are sound insulating materials, and not sound absorbent materials. The difference is significant, since a piece of hard board may conceivably be a far more efficient sound insulating material than a piece of porous felt, although the latter is obviously a more efficient sound absorber. In at least one recent instance, the specification for a dash mat called for a sound absorption coefficient of a certain value at 512 cycles. This was comparatively meaningless, in view of the fundamental function of the dash mat. There are at present very few tests available which show the sound insulating efficiency of various types of dash insulations. It seems reasonable to suppose, however, that a specification could be written which would state within a reasonable margin what degree of sound insulation should be expected. This should be expressed in decibels transmission loss just as the values of sound insulating walls and partitions are expressed in the building industry. It would be necessary, of course, to specify the efficiency of the insulating material in terms of the improvement to be effected over the metal dash frame itself. It should also

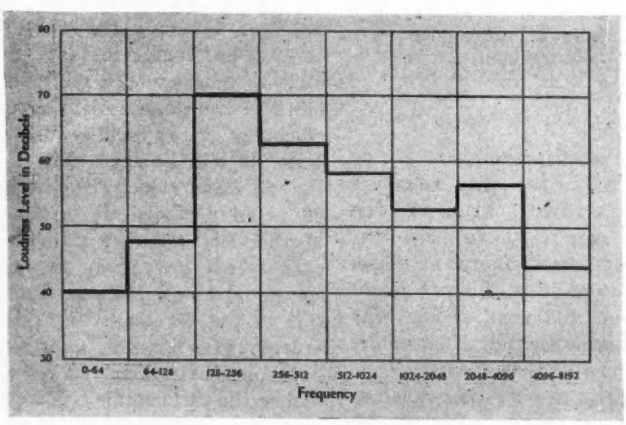

Fig. 2—Frequency spectrum. Average of 4 positions, inside of car 50 miles per hour.

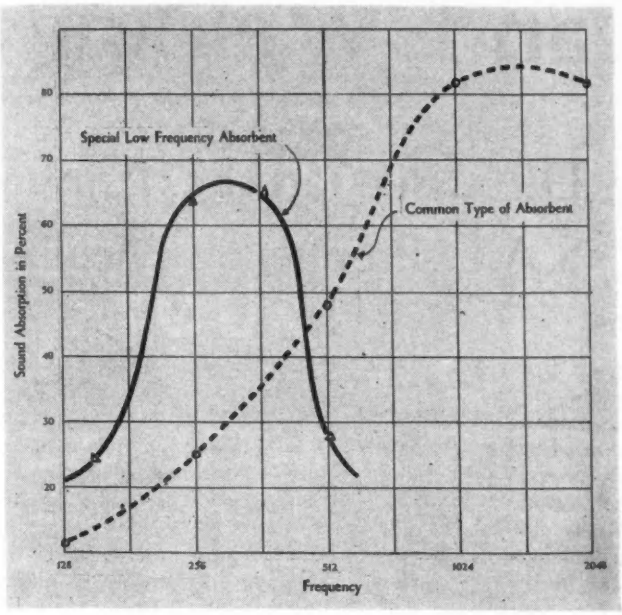

Fig. 3—Absorption frequency characteristics of two sound absorbent materials

be noted that unless all openings are effectively plugged or sealed, a dash mat cannot be expected to reach its true efficiency. A recent set of laboratory experiments has shown that the transmission loss of a typical automobile dash is increased more than 3 decibels when the openings were sealed, although the total area open was less than 4 sq. in.

The most common type of noise reducing material employed in the modern passenger car is known as deadening material. A more accurate description is to speak of it as vibration damping material. It functions to increase the internal resistance of the steel panels to which it is applied, thereby reducing the amplitude of vibration. It will be seen from this definition that a damping material is intrinsically neither a sound absorbent material nor a sound insulation material. It may be incidentally one or the other, but to specify it in terms of the last two quantities is completely misleading. Since the most obvious action of a damping material is to increase the rate at which a panel vibration is damped out, the writer suggested the use of the term "vibrational decay time" as indicating the efficiency of a damping material. This vibrational decay time is taken as the length of time required for the amplitude of vibration of a steel panel, upon being given a shock excitation, to die away to one-thousandth of its original value. Obviously the shorter the decay time the more efficient is the damping material, and the less likely the panel to respond to the vibrations which drive it. This quantity, from an acoustical standpoint, has the particular advantage that it closely parallels the quantity commonly used to describe the rate of decay of a sound in an enclosure, namely, the reverberation time. The period of reverberation is defined as the length of time required for the sound to die away to one-millionth of its original intensity, which corresponds to a reduction of one-thousand times in amplitude.

Before such a quantity can receive general acceptance it would be necessary to specify the method of shock excitation, the size and gauge of the steel sheet to be tested and the method of framing or mounting. We have found in our own experiments that when these various quantities are kept constant an excellent degree of reproducibility is obtained. In view of the large number of materials now offered on the market as damping materials, it seems highly desirable that some such standards be devised by the industry, possible through its engineering groups.

It should be noted, as in the case of sound absorbent materials, that the method of application is critical and that the damping efficiency of a material cannot be specified unless a simple and reproducible method of application is supplied. For this reason materials which are readily applied and which can be counted upon to adhere firmly and uniformly to the panel have special advantages.

The most common method of judging damping materials now used in the automotive industry is the so-called "knuckle" test. Experiments were conducted recently in our laboratory to determine how closely the judgments made by the "knuckle" test corresponded with instrumental measurements. Six different materials were examined, having a wide range of decay times. Fifteen observers, all but three of whom were untrained in the work, were asked to judge the materials in the order of their excellence. Care was taken that the observers should have no inkling as to what the treatment was. The judgments were made by pairs, the observers selecting in each case the panel of the pair which he considered most satisfactory. In no case did any observer fail to rate the panels in their proper order. The tests indicated, however, that where there were small differences, the instrumental measurements were more reliable. It would appear that by specifying the decay time it is possible to obtain an index of the efficiency of damping materials which will both corroborate and improve upon ear judgments.

The discussion given herein is of necessity brief. In buying sound absorbent materials it is desirable to specify the sound absorbent coefficient between 100 and 500 cycles. In the case of sound insulating materials, the transmission loss at these frequencies should be specified in decibels, as an increment to the insulating efficiency of the base construction. Damping materials should be specified in terms of their vibration damping efficiency, and the vibrational decay time offers one method of describing these materials.

Finally, it should be remembered that no one source of sound within the car can be considered as an invariable offender. Different cars of different designs will create different noise problems. In one case the 1934 model of a certain car was materially improved by the installation of a better dash mat, the reduction being of the order of 6 decibels. In the 1935 model of the same car no improvement resulted when the new mat was instalied. This does not prove that the dash mat was less efficient, but merely that in the later model more sound was generated from other sources. It is most important to remember in attacking a new problem that whereas previous experience should indicate the general method of attack, the order of importance of the various noise sources may be entirely changed.

Rust-Proofing and Welding

Discussed at the Annual S.A.E. Production Meeting

IN discussing the paper by F. P. Sprurance on "Rust-Proofing and Paint-Adherence Technique," W. B. Hurley of the Detroit Edison Company mentioned that a new method of rust-proofing had been developed in Detroit recently in which electric induction heating is applied to speed up the operation and reduce the cost.

A motor generator is used to step up the frequency from 60 to 960 cycles per second. The parts to be rust-proofed are cleaned in the ordinary manner and after the rinse immediately pass through an induction coil, where they are given a heavy charge of induction heat. This quickly dries off any remaining moisture and thus stops the formation of rust after the rinse before it has a chance to start. While still hot, the parts pass into the rust-proofing tank, which in this case contains activated phosphates. They immediately enter the field of another induction coil and become heated, which facilitates the deposition of a fine-grained coat of phosphate. On leaving the rust-proofing tank, the parts pass through another induction coil, where they are quickly dried. If desirable, they could then be painted and passed through an induction oven for the final drying.

Such a combination of cleaning, rust-proofing, painting and drying could be worked out very nicely on a continuous conveyor system and would lend itself admirably to heavy production jobs.

From the tests so far run, this method of rust-proofing as compared to the similar method without the application of induction heat, appears to produce a more highly resistant rust-proof film and to produce this film more quickly and with a saving in the amount of chemicals used. The cost of the electricity is a very small item, and where reasonable electric rates prevail, the induction heat could be used for keeping the rust-proofing tank at the proper temperature. Where electric rates are higher, the tank could be heated with steam and electric induction used only for heating the parts to be rust-proofed.

The fineness of the grain of the phosphate coating produced by the induction heating apparently makes the phosphate film denser and more resistant to the penetration of moisture.

This process is used at the Budd Wheel Company in Detroit in the rust-proofing of wheels preparatory to the painting operation.

Mr. Hurley, in cooperation with L. W. Clark, also presented written discussion of the Weiger paper on Resistance Welding in the Automotive Industry. They expressed the opinion that while much attention had been given to mechanical features in the new welders, the problem of heat control and how it is affected by variations in voltage due to other welder operations in the same plant is of equal importance. A good plant system of power supply is essential in any case, but it becomes especially important as welders become progressively larger from year to year, with more and more applications turning to welding. A single welder presents no serious problem, but a group of large welders served from a common power source may present a problem in voltage regulation which requires special study. If there is an excessive voltage drop at the time of making a weld, two or more welders cannot be operated simultaneously, or cold welds will result.

Perhaps the first consideration when the problem of excessive voltage drop is encountered should be the welder itself. A great majority of the large present-day flash and projection welders are of a design (perhaps of necessity) having a generous distance between the welding electrodes and the built-in transformer, introducing a high reactive loss with a resulting low power factor load. Too much emphasis cannot be placed on good electrical design, especially in the larger-size units where maintaining good supply voltage is a real problem. By keeping the secondary circuit of the welder to an absolute minimum length a marked improvement in power factor results. There are some well-designed large welders which have power factors between 60 and 70 per cent, but in the vast majority of cases it does not seem that the electrical design has followed the same rapid advance as that of the mechanical design, with the result that operating power factors of 30 and 40 per cent are the rule rather than the exception.

Low power factor is a real detriment to good welding whenever it becomes necessary to serve more than one welder from a step-down bank of power transformers. With large welders increasing in numbers in all automobile and accessory plants, it is essential that the electrical standards be kept at a high level. On the average installation a welder with a power factor of 30 per cent will cause over twice the voltage drop in the power supply as one operating at 60 per cent and producing the same weld. This clearly indicates the necessity for keeping the power factor as high as possible.

Practically all welders are single-phase in operation, and where possible they should be balanced on the three phases of the power source if they constitute an appreciable part of the plant load. However, it is essential from the standpoint of voltage drop that the balancing or grouping be accomplished on the high voltage side of the stepdown power transformers. For instance, if there are three or more groups of welders in a plant, each group fed by separate transformer banks, the transformers should be connected in single-phase groups rather than in three phase delta combinations. A given welder fed from a bank of three transformers connected in delta or Y will cause twice the voltage drop through the transformer as when fed from the same three transformers connected in parallel on a common phase. Thus, for the same voltage conditions there need be only one-half the investment in transformer banks if they are connected single phase, and the load balance obtained by balancing groups of welders rather than balancing the individual welders on separate phases.

The Chrysler Highland Park plant, the Midland Steel Products Co., and the Kelvinator Corp., all in Detroit, have good examples of interlaced bus construction.

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